CONSTRUCTION NEWS

Supplement to ENGINEERING NEWS. New York, December 29, 1910.

CONTENTS.

CONSTRUCTION NEWS:
Railways 309
Electric Railways 309
Light and Power Plants..... 309
Bridges 310
Buildings 310
Water Supply and Irrigation..... 312
Sewerage 313
Garbage Disposal 313
Streets and Roads..... 313
Manufacturing Plants 314
Miscellaneous Contracts 315
PROPOSALS 316

RAILWAYS.

(*Denotes that this work is advertised in Engineering News.)

ALGOMA, CENTRAL & HUDSON BAY R. R.—Bids are asked until Jan. 2 for the construction of road bed and structures on the Manitoulin & North Shore from Crean Hill to a connection with the present line at Espanola, south to a point near Mile Post 61.

ATCHISON, TOPEKA & SANTA FE RY. —Press advices are to the effect that surveys are being made for a line through the Palo Verde Valley, Cal., which will run through the towns of Blythe, Neighbors, Palo Verde and Rannells.

HOCKING VALLEY R. R. CO.—Press advices are to the effect that this road will double-track its line between Toledo and Columbus, 122 miles, during the coming year. Wm. Michel, Columbus, Ohio, is Engr., M. of W.

INTERSTATE R. R.—A contract for the construction of a 5-mile extension on the Roaring Fork branch of this road has been awarded to BUNN & CO., Big Stone Gap, Va. W. A. Johnson, Stonega, Va., is Supt.

KANAWHA, GLEN JEAU & EASTERN R. R. CO.—We are officially advised that the new six mile connection with the Virginian Ry. has been completed. Two storage yards were also built. Victor S. Veazey, Mt. Hope, W. Va., is Ch. Engr.

KANSAS & SOUTHEASTERN RY. — The contract to build a branch line from Anthony to Almena, Kan., 225 miles, has been awarded to the ST. LOUIS CONSTRUCTION CO., St. Louis, Mo.

LONG ISLAND R. R. CO.—In the elimination of the grade crossing at Duck Pond Road, Glen Cove, the company plans an overhead highway bridge, the approximate cost of which will be $45,000. J. R. Savage, Jamaica, L. I., N. Y., is Ch. Engr.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE RY.—Surveys have been made for an extension from Frederic, Wis., to Duluth. The proposed line will be about 60 miles long and will give practically an air line between Duluth and Minneapolis. Thos. Green, Minneapolis, Minn., is Ch. Engr.

MINNESOTA. — Articles of incorporation of a new railroad for northern Minnesota are being prepared. It will be known as the Northern Minnesota Ry. Co., and Edward Hines of Chicago will be Pres.; G. W. Lindsay, Vice-Pres., and S. J. Cusson, Secy. and Treas. The main line will be from Cusson, a station on the Duluth, Rainy Lake & Winnipeg line of the Canadian Northern 47 miles north of Virginia, to Crane Lake.

MISSOURI, OKLAHOMA & GULF R. R. CO.—A branch line from Wapanucka to Bromide, Okla., 7 miles, is contemplated. J. J. Harrison, Muskogee, is Ch. Engr.

NEW YORK CENTRAL & HUDSON RIVER R. R.—Press advices are to the effect that the double-tracking of the Harlem from Pawling to Chatham is contemplated, also the four-tracking of the present double-track from Mount Vernon to North White Plains. Geo. W. Kittredge, Grand Central Station, New York, N. Y., is Ch. Engr.

OHIO-COLUMBUS.—A company is being organized by C. E. Hunter, formerly general counsellor of the Hocking Valley R. R. Co., to build and operate a steam belt line around Columbus. This will be 22 miles and the cost is estimated at $6,000,000. Stanley D. Pugh is Engr.

PENNSYLVANIA R. R.—The Philadelphia terminal is to be enlarged. A new and wider bridge will be built across the Schuylkill River. The company has for some time been buying property on Filbert St. adjoining the track and the buildings thereon are now being demolished. The old three-hinge arch trainshed is to be taken down, according to press reports, and new sheds of the butterfly type are to be erected. The work will cost about $6,000,000. Alexander C. Shand, Philadelphia, Pa., is Ch. Engr.

PORT SIMPSON, PRINCE RUPERT & NORTHERN SHORT LINE.—Surveys are now being made for a line between Prince Rupert and Port Simpson, in British Columbia, a distance of 27 miles. The main office of the company is at Prince Rupert, B. C.

ELECTRIC RAILWAYS

NEW HAVEN, CONN. — The Shore Line R. R. Co. it is stated, will petition the next session of the Legislature for the right to extend its lines in the towns of Branford, North Branford, Clinton, Madison, Chester, Essex, Guilford, Lyme, Saybrook, Old Saybrook and Westbrook. And also to use its power in connection with the Connecticut River drawbridge. A. William Sperry, New Haven, is Secy.

WATERBURY, CONN.—The Connecticut Co. has received permission, with certain conditions, from the Bds. of Aldermen and Pub. Wks. of the city for the construction of single track lines in North Vine and Homer Sts. and the extension of double track on North Main St. These lines are a part of the extension to be built from the Highland Div. to Chase Rolling Mill.

WATERBURY, CONN.—It is expected that the Connecticut Co. will soon make application to the city for permission to make a single-track extension from the present North Main St. line through Griggs, Walnut, Farm, Oak, Howard and Wolcott Sts. to connect with their line in East Main St. This line will be from 7,000 to 8,500 ft. in length, according to the route selected.

BUFFALO, N. Y.—The Frontier Electric Ry. Co. has filed with the County Clerk of Erie County plans and profiles of its proposed route, Buffalo to Niagara Falls, a distance of 25 miles. The application of this company to compel the City of North Tonawanda (through which city its route is laid out) to grant a franchise, free from all conditions regulating its rates for passenger and freight service, has been denied by the Supreme Court of the State of New York. The company will therefore be obliged to accept the city's franchise, subject to the conditions imposed, or build around North Tonawanda.

PHILADELPHIA, PA.—Stockholders of the Rapid Transit and the Union Traction Cos. will meet at a special meeting, Feb. 28, to vote on E. T. Stotesbury's plan to rehabilitate the finances of the Rapid Transit Co. The plan involves loans to the extent of $10,000,000, under Union Traction guarantee.

LANCASTER, PA.—According to press reports, M. S. Hershey will construct a street railway line from Campbelltown to Lebanon, a distance of nine miles.

BALTIMORE, MD.—Former State Senator Marion V. Brewington is conducting a hearing before the Public Service Commission to-day for the Wicomico Electric Light and Power Co. in the interest of the proposed electric railway line for Wicomico.

NEWBERN, N. C.—The Neuse-Trent Traction Co. will soon award contract for the construction of a line four miles long. A. C. Stevens, Newbern, is Pres. The company is capitalized at $200,000.

BIRMINGHAM, ALA.—It is reported that FURTWANGLER & SMITH have been awarded a contract for the construction of 2½ miles of lines for the Birmingham & Edgewood Electric Ry. extension, to the foot of the Shades Mountain.

COLUMBUS, OHIO.—More than $200,000 will be expended next year on the Springfield-Dayton division of the Ohio Electric system, and as much more in the renewing of bridges and tracks on the Columbus and other divisions.

Bids for furnishing labor and material necessary to construct street railway tracks on West Broad St., between Glenwood Ave. and Yale Ave., will be received until noon, Jan. 6, by H. S. Holdton, Dir. of Public Service.

DEFIANCE, OHIO.—Surveyors have been out all this week working on the Northwestern Ohio Interurban Ry., and have completed the line from Evansport to Bryan. This road will connect Defiance, Bryan and Montpelier, by way of Evansport.

IRONTON, OHIO.—An extension of the right-of-way through Lawrence County was sent by County Auditor Robinson, acting under the instructions of the County Commissioners, Monday, to A. E. Cox, Pres. of the Cincinnati-Pittsburg Electric Ry. Co. The company proposed to build the line at an early date.

MINERVA, OHIO. — THE McGINTY CO. has been awarded the contract for doing the grading upon the A. A. Shortline Electric Ry., which it is proposed to build between Alliance and Akron. A large block of the bonds have been placed.

WARREN, OHIO.—John H. Ruhlman, Pres. of the Lake Erie & Youngstown Ry., which proposes to construct an electric line from Youngstown to Conneaut, says that work on the line will be started in earnest in the spring.

TERRE HAUTE, IND.—Charles F. Probst, Pres. of the Illinois Central Public Service Co., owning the Mattoon and Charleston Traction system, arrived in Paris to complete the plans for extensions which will connect the roads with those of the McKinley system in Indiana.

GRAND LODGE, MICH.—W. H. Zimmerman, 164 Dearborn St., Chicago, will take bids in the spring on the rails and ties for the new 12-mile railroad for the Lansing and Grand Lodge R. R. Co. Engineer is considering using a three-rail system. Will get power from Michigan Power Co., at Lansing.

MADISON, WIS.—Announcement has been made that the Chicago & Wisconsin Street Ry. Co. will start construction work next April, and will also build the proposed line around Lake Monona.

MILWAUKEE, WIS. — The Milwaukee-Western Electric Ry. proposes to construct an interurban line next summer from Milwaukee to Fox Lake, a distance of about 70 miles. Local capital is now being interested in the project.

THE NORTHWESTERN ENGINEERING & CONSTRUCTION CO., 1317-1319 Majestic Bldg., has been awarded the contract for building the Sterling-Moline Traction Co.'s interurban line in Illinois. The line will run from Princeton to Sterling and to Moline. The contract price is $2,800,000.

MOORHEAD, MINN.—It is reported that the Fargo & Moorhead St. Ry. Co. is contemplating an extension of its lines to Dilworth. It is said that the Northern Pacific has offered substantial assistance and besides supplying the ties and rails will grant the necessary rights-of-way.

HELENA, ARK.—An extension two miles long, is contemplated in the spring by the Helena Interurban St. Ry. Co.

ROCKPORT, TEX.—The Rockport & Aransas Pass Ry. Co., which was recently organized with headquarters here, will construct an interurban railway between Rockport and Aransas Pass. Either electric or gasoline motor power will be used. Among the parties interested in the project are Charles F. Hoff, R. W. Newberry, S. A. Clevenger and Charles G. Johnson, of Rockport.

LOS ANGELES, CAL. — PALMER, McBRIDE & QUAYLE, Pacific Electric Bldg., have secured the contract, at $400,000, for the construction of a 10-mile extension of the Los Angeles-Pacific electric line from Hollywood to Lukershim, thence five miles west to Kester.

SAN FRANCISCO, CAL.—Application for a franchise has been made by Willis Polk, on behalf of the Great Highway Development Co., to the Park Commissioners to construct and operate a miniature line on the great highway, from the Cliff House to Sloat Boulevard, a distance of three miles. The proposed line will cost about $30,000, and the fare would be about five cents for each passenger.

SAN BERDINO, CAL. — GEORGE WEST has secured the contract for further Santa Fe improvement work, consisting of widening the roadbed on the valley division, between Bakersfield and Laton, a distance of 86 miles; the work includes the placing of 3,000 yds. of dirt to each mile to bring the roadbed up to grade, and laying heavy rails. Amount, $75,000.

SACRAMENTO, CAL. — The Sacramento Electric Gas and Ry. Co. proposes to build connecting lines so as to extend its K street line from 15th to 21st Sts., and to extend its 21st St. line north from 21st, and P to K St. to connect with the proposed K St. extension. The company has made application for a franchise for a period of 25 years. Geo. Halberton, San Francisco, is Ch. Engr.

GRAND CANYON, ARIZ.—Pres. Frank H. Dudley, of Niagara Falls, N. Y., and John W. Burke, of New York, chief engineer of the Utah & Grand Canyon R. R. Co., recently made a trip over the proposed 500-mile line into the Grand Canyon, connecting with the Salt Lake Road at Lund, Utah, with the Santa Fe road, at Marysville, Nev., and a connecting link between Foquerville and Fredonia, Ariz. Pres. Dudley is reported saying construction work will begin at an early date. The company is capitalized at $150,000 for the initial work; it is stated the Utah Southern Co. is affiliated for exploitation purposes.

HAMILTON, ONT.—The Hamilton & Port Dover Electric Ry. Co., which was recently granted charter to construct its line between Hamilton and Port Dover will build its power house at Caledonia where the new line will intersect the Grand Trunk Railway. The matter is in charge of George Leach Staunton, K. C. Pres., Hamilton.

LIGHT AND POWER PLANTS.

(*Denotes that this work is advertised in Engineering News.)

BOSTON, MASS.—A power plant is to be built the coming season at South Boston by the Boston Elevated R. R. Permission has been obtained to fill the old reserved channel, and provision has been made for using sea water for condensing purposes.

BOSTON, MASS.—Bids were opened Dec. 24, under the following items: (A) For furnishing, maintaining and operating approximately, 10,000 incandescent electric lamps in addition to the incandescent lamps now maintained under the existing electric lighting contract, or for the extension of the existing electric lighting contract for a period of ten years from Jan. 31, 1911; (B) for furnishing, maintaing and operating approximately 10,000 gas lamps with incandescent mantle burners; (C) for furnishing, maintaining and operating approximately 10 gas lamps with incandescent mantle burners and automatic lighting and extinguishing devices; (D) to furnish and install approximately 10,000 gas lamps with incandescent mantle burners; (E) to furnish and install approximately 10,000 gas lamps with incandescent mantle burners and automatic lighting and extinguishing devices. Items A, B and C also include the maintenance and operation of approximately 210 fire-alarm signal lamps. The city will furnish the lamp posts. Bidders are to state a price for furnishing, maintaining and operating each lamp per annum, and price per lamp and automatic device complete and installed. Under items D and E the city will furnish the gas by purchase from the gas company and provide for maintenance. Under Item D only, the Ramsdell Inverted Lamp Co., Waterbury, Conn., bid $17, and William O. Rumpf, Boston, $7. The Edison Electric Illuminating Co. offered to continue its present contract on a 10 per cent. reduction from its present contract.

BOSTON, MASS.—Bids will be received until Dec. 30 at the office of Manus J. Fish, Supt. of Public Bldgs., for electric and gas appliances for Curtis Hall building.

HOWARD, R. I.—Bids will be received noon, Jan. 9, by Charles Potter, Secy. Board of Charities and Corrections for an electrical and plumbing system in the Reception Hospital now in the course of erection on the State Farm, Howard, R. I. Plans and specifications may be obtained from Martin & Hall, Archts., 800 Union Trust Co., Providence, R. I.

BUFFALO, N. Y.—The International Bridge Co. has completed plans for a 1-story powerhouse, to be erected at Niagara St. and the Erie Canal, near the bridge entrance.

ALBANY, N. Y.—The bids received by the Trustees of Public Buildings on Dec. 21, for the construction of new power-house on Hawk St., Albany, for supplying heat and power to the Capitol and Educational Building, were: R. T. Ford Co., Rochester, N. Y., $346,287; A. Pasquini, New York, $366,882; R. M. Booth, Albany, N. Y., $382,900; Hudson Valley Construction Co., Troy, N. Y., $387,400; the Connors Brothers Co., Lowell, Mass., $394,390; Feeney & Sheehan, Albany, N. Y., $413,000; Morris Kantrowitz, Albany, N. Y., $414,000; Peter Keeler Building Co., Albany, N. Y., $426,399; Luke Burke & Sons, New York, $439,750; F. B. Ware is State Archt.

NEW YORK, N. Y.—Bids will be received until 2 p. m., Jan. 10, by Kingley L. Martin, Comr. of Bridges, for constructing elevator, stairs, drainage, ornamental and electrical work for the anchor piers of the Queensboro Bridge over the East River, between the Boros. of Manhattan and Queens.

NEW YORK, N. Y.—Bids received by the Bd. of Public Charities, New York City, for furnishing all the labor and materials required to remove four hydraulic elevators in Kings County Hospital and replace same with electric elevators, were as follows: Maintenance Co., 54 Franklin St., $13,800; Excelsior Rep. & Supply Co., $22,867; A. S. Traub, $15,300; National Elevator Co., $17,254; Otis Elevator Co., $17,695. For furnishing and installing laundry machinery and appliances in Staff Laundry, Metropolitan Hospital District, Blackwell's Island: Troy Laundry Machinery Co., $11,798; American Laundry Machinery Co., 132 West 27th St., $11,267.

TROY, N. Y.—The Wells-Boughton Co., of this city, was the lowest bidder for the construction and equipment of the power house on the Erie Barge Canal at Crescent Dam, at $42,940, for which bids were opened Dec. 21 by State Supt. of Public Works Frank C. Stevens, Albany.

WILLIAMSVILLE, PA.—The application of G. E. De Golio, of Buffalo, for a franchise for the construction of an electric line for lighting, heating and power purposes, from Main St., City line, to the Transit Road, was granted at the last meeting of the Town Board of Amherst.

BALTIMORE, MD.—The city is having plans prepared for proposed dam on Gunpowder River and other improvements, for which the Board of Estimates has appropriated $2,000,000. Alfred M. Quick is Engr., Baltimore.

ERWIN, TENN.—Nolichucky Power Corporation, Erwin, Tenn., has plans and estimates for its water power electrical plant, to cost $434,000.

COLUMBUS, OHIO.—Bids will be received until 9 a. m., Jan. 13, for heating and electrical wiring in the Omaha Penitentiary. Plans and specifications may be obtained from Marriott & Allen, Archs.

SIDNEY, OHIO.—Bids will be received by Edd. McVay, Director of Public Service, until noon, Jan. 2, for street lighting for a period of 10 years. This contract will cover about 110 street arc lights and from 50 to 75 incandescent alley lights. Further information may be obtained from the Dir. of Public Service.

AKRON, OHIO.—Construction work will soon be started on the power house of the Northern Ohio Traction Co. Surveys have been made and plans will soon be prepared. The estimated cost is about $2,000,000.

MARION, IND.—The city has issued $50,000 of bonds for the construction of a municipal light plant. Bids will be in order by the Board of Public Works as soon as the bonds are sold.

INDIANAPOLIS, IND.—The Southern Indiana Power Co. has incorporated with a capital of $800,000. The company proposes to build and equip power plants for the generating and distribution of electricity for lighting and power purposes. The plants will be located in coal fields, the first to be erected will be near Bedford, Ind. The company's home office will be in Indianapolis. Frederick E. Matson, Thos. N. Stillwell, Wm. J. Henley, E. E. Gates and Gustave H. Mueller are directors.

SUPERIOR, WIS.—Preparations are being made by the Minnesota Canal Power Co. for the erection of an immense power plant on the St. Louis River, near Cloquet. Power will be furnished for the industries of Superior and Duluth. A canal and large flume will be constructed and it is estimated that at least 80,000 HP. can be developed.

NEW RICHMOND, WIS.—A project for electric power transmission on the Kinnickinnic River Falls is under way. A dam and power plant will be erected during the summer and electrical energy will be generated and will be transmitted to Prescott, Wis. and Hastings Minn.

PRAIRIE DU SAC, WIS.—Work will soon commence on the new power dam to be constructed here. The dam will be 1,500 ft. long with 1,000 ft. of spillway. The remainder of the space across the river will be

used for docks. Electric power will be furnished to many industries in this part of the state.

CROWLEY, IA.—A resolution was passed for the improvement of the electric light plant, authorizing the purchase of a 110 HP. engine and a 150 KW. dynamo and a 75 KW. dynamo. The object of the new system is to install a two-unit system and a 24-hour service of lights and power.

SCOTT CITY, KAN.—Business men here are discussing the installation of electric light in connection with electric transmission for pumping water for irrigation. A. F. Goodwin, of the Citizens Bank, is interested.

WAHPETON, N. DAK.—The Otto Tail Power Co. expect to be in operation soon. The company will furnish electrical service to Wahpeton, Breckenridge and Fergus Falls.

PARIS, TEX.—The City Council has retained F. H. Lancashire, of Dallas, Tex., to make a detail report on ways and means of improving the water pumping plant and building a municipal street lighting plant. Ed. H. McCuistion, Mayor.

GEORGETOWN, TEX.—The City Council has retained F. H. Lancashire, of Dallas, Tex., to make plans and specifications and advise as to the reconstruction of the old lighting and water plant. Bonds recently voted to the amount of $45,000 have been sold. R. E. Ward is Mayor.

GEORGETOWN, TEX.—The Georgetown Water & Light Co.'s plants will pass into the hands of the city on Dec. 30. Of the $45,000, which the town derived from a recent bond issue, $31,500 will be spent in improving the plant, the remainder going to its purchase.

FORT STOCKTON, TEX.—Clay Bros., of San Angelo, Tex., will install an electric light plant and ice factory at this place. They have been granted a 10-year franchise for the proposed improvements by the Board of County Commissioners of Pecos County.

CLOVIS, N. MEX.—W. D. McBee, of this place, and associates, are preparing to install an electric power plant and construct a system of transmission lines to the farms in the vicinity of Melrose, N. Mex., to provide power for operating irrigation pumping plants. The McBee syndicate will install the motors and pumps at the different wells from which the water is to be obtained. It is planned to reclaim about 12,000 acres of land by this method. It is stated by Mr. McBee that the project involves the expenditure of about $300,000.

FARMINGTON, N. MEX.—J. A. Clay, Gen. Mgr. of the Durango Electric Co., and the San Juan Water & Power Co., has been investigating the situation at Farmington, N. Mex., with the view of extending the electric power transmission lines of his interests to this locality, for the operation of irrigating pumping plants and other power purposes. It is reported that he will also take over the Farmington electric light plant.

LAS CRUCES, N. MEX.—At a recent meeting of the Elephant Butte Water Users' Association, held here, President H. B. Holt officially reported that the federal government has embraced in its plans for the construction of the great dam and land reclamation enterprise in the upper valley of the Rio Grande the installation of a hydroelectric plant that will utilize the maximum amount of power afforded by the water storage reservoir, and that this electrical energy will be conducted over the valley for the use of the farmers.

CANYON CITY, ORE.—Arrangements are being made by the Oregon Light & Power Co. for the installation of an electric plant at Magoon Lake and furnish power and light for the Day Valley. W. C. Parrish, Baker City, Ore., is interested.

PORTLAND, ORE.—A tract of land has been purchased by the Mont Hood Ry. & Power Co., from the Peninsular Lumber Co. on the Willamette River for the purpose of erecting an auxiliary steam power plant. The contract for the erection of the foundation has been awarded to CHARLES E. MOORE, San Francisco.

ELSINORE, CAL.—M. L. Gamburn and Mrs. M. A. Gardner have applied for a 50-year gas franchise from the City Council, and will drill for natural gas.

LOS ANGELES, CAL.—NEWBERRY-BENDHEIM CO., 125½ West Third St., has contract for electric wiring in residence for E. W. Britt on West Adams St.

LOS ANGELES, CAL.—CHARLES W. CORBALEY, Wilcox Bldg., has been awarded contract for the construction of a large hydraulic system for the new power plant of the San Diego Ry. Co., at San Diego, Cal. It will consist of two 5-ft. conduits leading from the bay at the foot of E St. to the power house at Arctic and E Sts. Here a battery of pumps will drive the water into a set of condensers. The cost of the system will be $50,000.

LOS ANGELES, CAL.—The MACHINERY & ELECTRICAL CO., 351 N. Main St., have been awarded contracts as follows, on the new hospital building being erected on Orange St., for the General Osteopathic Association: For installing heating and ventilating system and boiler room plant, $12,944; for installing a Spencer vacuum sweeper plant and piping, $1,640. Specifications provide for, Union Iron Works of Erie, Pa., Scotch marine type boilers equipped with Morrison corrugated furnaces and cyclone oil burning front, furnace and burner; Westinghouse Air Brake Co.'s motor-driven air compressor, two motor-driven centrifugal boiler feed pumps, General Electric motors, Eclipse pumps, vertical domestic heater, equipped with syphon ideal thermostatic regulator and "Crane" trap; sump pump, B. F. Sturdevant Co.'s type heating coils, fans, exhausters, etc.; National Regulator Co.'s thermostatic system of automatic regulation; Paul system of steam distribution. Norman F. Marsh, Architect, Broadway Central Bldg.

QUINCY, CAL.—An application for a franchise has been filed with the Board of Supervisors of Plumas County by the Portola Electric Light & Power Co., to erect poles and wires for transmitting electric heat and power upon the public streets of Beckwourth and Quartz Townships. Bids will be received by the Board up to 10 a. m., Jan. 6, for the sale of franchise to the highest bidder.

SANTA BARBARA, CAL.—The Santa Barbara Gas & Electric Co. has contracted for the erection of three new buildings, to be added to its plants in various parts of the city. A one-story brick power-house will be built on Castillo St., to cost $8,000. A steel and iron tank will be erected on Quarantiana St. Cost, $7,000. The third building will be a small frame structure on Montecito St.

LOS ANGELES, CAL.—THE FOULKES-GAYLORD ELECTRIC CO., Security Bldg. has secured the contract for the electrical wiring in the 10-story building, being erected at 7th and Olive Sts., for the Los Angeles Athletic club, amount $12,000.

The THOMAS HAVERTY CO., 517 So. Los Angeles St., has been awarded the contract for plumbing and gas fitting at $32,000. Parkinson & Bergstron, Archs., Security Bldg.

SAN FRANCISCO, CAL.—Plans have been completed by Alfred I. Coffey, City Arch., for the power-house and laundry building which are to be features of the new San Francisco Hospital, at 23d St. and Potrero Ave., where the necessary foundation work is already being done. Upon the first floor of the power-house will be installed four steam turbines generating from 125 to 250 volts, while space will be provided also for a fifth turbine if needed.

TRUCKEE, CAL.—Work will soon commence on a new power-house at Verdi to be built by the Truckee Gen. Electric Co. M. Fleishhacker, San Francisco, is Pres.

PETERBOROUGH, ONT.—Bids will be received until Jan. 5, by the Canadian General Electric Co., 212 King St. West, Toronto, for the construction of a power-house on the water-works dam near Peterborough. Plans at company's office, or from Wm. Kennedy, Jr., Y. M. C. A. Building, Montreal.

OCAMPO (Chihuahua), MEX.—H. C. Flipper, of El Paso, representing the Sierra Mining Co., has been granted a concession by the Government of this state for the installation of a hydro-electric plant near Ocampo. The proposed plant will furnish power for the machinery of the mines of the Sierra Mining Co.

GUADALAJARA, MEX.—The Guadalajara Gas Co., an American concern, which has a concession from the government for the construction of a large gas plant and distributing system here, has started the work of laying the mains.

BRIDGES.

(*Denotes that this work is advertised in Engineering News.)

BOSTON, MASS.—Plans have been completed by the engineers of the Boston & Maine R. R. Co. for the construction of a bascule bridge over the Saugus River, on the Portland division. J. P. Snow, Ch. Engr., at a hearing before the Harbor and Land Commission stated that the company proposes to build the bridge for two tracks only, but to erect a foundation under the low-water mark for use later if the company finds it necessary to lay two more tracks. Provisions have been made for a 50-ft. draw, which will be 20 ft. wider than the draw in the present bridge, and sufficiently wide to satisfy the requirements of the War Department. It is probable that the plans will be approved without delay, and as soon as the proper authority has been given to the company the contracts will be awarded. A temporary bridge will be built to handle the traffic while the permanent bridge is being cobstructed.

HARTFORD, CONN.—See item under Streets and Roads.

BRIDGEPORT, CONN.—A resolution empowering the Mayor to appoint a committee to investigate the feasibility of constructing a bridge at East Washington St. was adopted on Dec. 14 by the Committee on Streets and Sidewalks. M. F. McKenna is City Engr. Noted on Dec. 8.

SYRACUSE, N. Y.—William S. Manning, Engr., Syracuse, is planning the construction of a 250-ft. bridge in connection with the construction of the Bridge St. extension work.

BUFFALO, N. Y.—The Grade Crossing Commission is considering the cobstruction of a new viaduct across the New York Central R. R. tracks at Eleventh St., between North and Grove Aves. J. L. Harper, Buffalo, Engr., has estimated the cost of the substructure at $45,000 and the superstructure at $70,000. Bids for the work will be asked soon.

ROME, N. Y.—The bids received by F. C. Stevens, Supt., Pub. Wks., Albany, on Dec. 21, for constructing a highway bridge over the Erie Canal at South Washington St., Rome, were: M. Fitzgerald, Hoosick Falls, N. Y., $16,265; N. D. Peters Company, Utica, N. Y., $15,600; HENRY TOSH & SON, Port Byron, N. Y., $14,777, (awarded contract); David I. Rogow, 75 Broadway, New York, $16,273; Lupfer & Remick, Elliott Sq., Buffalo, N. Y., $16,963; Scott Bros., Rome, $15,-164.

NEW YORK, N. Y.—Bids will be received by Kingsley L. Martin, Comr. of Bridges, until 2 p. m., Jan. 10, for constructing the elevators, stairs, drainage, ornamental and electrical work for the anchor piers of the Queensboro Bridge over the East River, between the Boroughs of Manhattan and Queens.

MORRISTOWN, N. J.—Frederick S. Smith, Engr. for the New Jersey & Pennsylvania R. R. Co., presented to the Morris Township Committee on Dec. 17 plans of a proposed bridge for Lake Road. The company is building an extension into Morristown, and plans to run the road under the street near the head of the old Speedwell pond. The plans contemplate the erection of a concrete arch bridge with stone abutments. The bridge, according to the plans, is to be 28 ft. wide and 16 ft. long, accommodating one track.

ALLENTOWN, PA.—The contract has been given by re-award to GEORGE H. HARDNER for widening the Hamilton St. bridge at $25,950. On Nov. 28 the contract was awarded to R. T. & C. D. Stewart Construction Co., of Easton, Pa., as noted on Dec. 8. Robert S. Rathbun is County Engr.

CATASAUQUA, PA.—The Delaware, Lackawanna & Western R. R. Co., it is reported, is considering the construction of a bridge over the Lehigh River here. Estimated cost, $10,000.

NORTHAMPTON, PA.—The Central R. R. of New Jersey is considering the construction of a bridge here. Estimated cost, $35,-000.

RICHMOND, VA.—Bids will be received until noon, Jan. 2, at Stuart, Va., Patrick County, and at Amelia C. H., Va., Amelia County, for the construction of the following steel bridges Stuart, Patrick County: Bridge over South Mayo River, four miles from Critz, length 70 ft. with a 12-ft. roadway, concrete abutments. Amelia C. H., Va., Amelia County: Bridges on Flat and West Creeks, 37 ft. 3 ins. and 35 ft. in length, respectively, with 12-ft. roadway. Plans for the bridges may be seen at the office of P. St. J. Wilson, State Highway Comr., Richmond, or at the offices of the Clerk of the Circuit Court at Stuart for the South Mayo River bridge and at Amelia C. H., for the Flat and West Creeks bridges.

MATOACA, VA.—The city and surrounding section of Chesterfield County are considering the construction of a steel bridge across the Appomattox River to connect with Dinwiddie. Estimated cost, $10,000.

FAYETTEVILLE, N. C.—Cumberland County will construct a bridge 65 ft. long, 12-ft. roadway. The structure will be of concrete or steel with concrete floor. Plans and specifications are asked by F. R. Hall, Clk. County Comrs.

SPARTANSBURG, S. C.—Spartanburg County will construct a wooden bridge across Macklewane Creek and over Cane Creek. Bids will be received until Jan. 4 and Jan. 5, respectively. D. M. Mills is Superv.

DUCKTOWN, TENN.—The JOLIET BRIDGE CO., Memphis, Tenn., has been awarded the contract for constructing the steel work for bridges over Burra Burra and Isabella Creeks in Polk County. Bids were opened by the County Court on Dec. 17.

MAYSVILLE, KY.—The city is considering the construction of a concrete and steel viaduct to connect the eastern end of the city with the business district. Estimated cost, $150,000. J. M. Walker is City Engr.

BUCYRUS, OHIO.—The Toledo & Ohio Central Ry. Co. is planning the construction of a steel bridge here to replace the existing bridge. J. A. Stocker is Ch. Engr., Columbus, Ohio.

WARREN, OHIO.—Bids will be received by the Commissioners of Trumball County, Warren, until Jan. 9 for the concrete work and bridge construction on the proposed new road to Mosies Lane.

LOCKLAND, OHIO.—Bids will be received until noon, Jan. 13, by the Board of County Commissioners, Cincinnati, Ohio, for the construction under Specification No. 125, of a concrete bridge on Cooper Ave., Lockland, Springfield Township. Fred Dreihs is Clk. Board.

COLUMBUS, OHIO.—The County Surveyor, Franklin County, Columbus, is preparing plans for the construction of a bridge over Blacklick Creek to provide the extension of East Broad St. Estimated cost, $18,000.

STEUBENVILLE, OHIO.—The Jefferson County Bridge Co. Steubenville, has been incorporated with a preliminary capital of $10,000 to build and operate a toll bridge across the Ohio River. The incorporators are: G. O. Nagle, E. E. Erskine, Carl H. Smith, John W. Marsh and Russell Hook.

ST. PAUL, IND.—The KELLEY CONSTRUCTION CO., has been awarded a contract for the construction of a bridge over Flat Rock River by the New York Central R. R. Co.

GROSSE POINTE, MICH.—The village is considering the construction of a bridge over Fox Creek, on the Cadieux Road.

CRESTON, IOWA.—Bids will be received by E. G. Smeltzer, County Audr., Union County, until noon, Jan. 4, for furnishing the material and constructing all bridges, except cement and cement walk, which may be ordered by the Board of Engineers during the year 1911. Separate bids for structural material and flooring will be required.

CEDAR RAPIDS, IOWA.—The City Council is considering the construction of a bridge at Third Ave. Bids will probably be asked about Feb. 1.

STILLWATER, MINN.—The investigation of the present condition of the bridge across the St. Croix River has resulted in a recommendation for the reconstruction of the bridge at a cost of about $19,000. L. W. Clarke is City Engr.

LAWRENCE, KAN.—The city has decided to construct a new 46-ft. bridge over Toy Creek.

WICHITA, KAN.—A bill will be introduced at the coming session of the Legislature providing for the construction of a bridge over the Arkansas River on 13th St. without the vote by the people. The County Commissioners favor the work. Estimated cost, $20,000.

NEWTON, KAN.—Bids are asked by the Board of County Commissioners, Newton, until noon, Jan. 3, for the construction of three iron and concrete bridges. J. A. Hunter is County Clk.

LA MOURE, N. DAK.—Bids will be received by the Board of Commissioners of Lamoure County, C. J. Alister, County Audr., until 2 p. m., Jan. 10, for furnishing corrugated galvanized metal culverts as may be needed during the year 1911.

DE SOTO, MO.—The Chicago, Milwaukee & St. Paul Ry. Co. is preparing for the construction of the bridge at the Government Way and Garden Sts., De Soto. Estimated cost, $65,000.

LITTLE ROCK, ARK.—The [illegible]enta St. Ry System, it is reported, is con[illegible]plating the construction of a bridge over [illegible] River at the foot of Broadwa[illegible] Arkansas

DALLAS, TEX.—The Dallas [illegible]unty Commissioners have awarded th[illegible]ract to H. H. YORTY, Fort Worth, at $1[illegible], for constructing Oak Cliff approach [illegible] Dallas-Oak Cliff Viaduct. The work [illegible]ll include about 50,000 cu. yds. of earth[illegible]Blackmon and 300 yds. of reinforced con[illegible] George L. Fearn is County Audr. [illegible] noted on Dec. 22.

MIAMI, OKLA.—The Oklahoma [illegible]s Kansas Ry. Co., Charles M. Jones, [illegible] Harter Springs, Kan., will construct [illegible]ale steel span in connection with 37 mi[illegible] railroad from Columbus and Galena, K[illegible] to Miami.

EL RENO, OKLA.—Bids will [illegible]ived by the Board of Commissioners [illegible] Canadian County, at the office of P. J. [illegible]s, County Clk., until 2 p. m., Jan. 2, for [illegible]construction of a steel bridge.

TACOMA, WASH.—The Mu[illegible]pal Commission on Dec. 15 voted to [illegible]tract vertical lift bridges across the [illegible] waterway at Eleventh St. and across [illegible] Puyallup River. Waddell & Harring[illegible] Consulting Engrs., Kansas City, Mo., will [illegible]rnish the plans and specifications for the [illegible]wo bridges and superintend construction. Estimated cost of the city waterway bri[illegible] $468,000; of the river bridge $124,000. [illegible] city waterway bridge will have a clea[illegible]nce of 135 ft. above the water. The two [illegible]dges were authorized by the voters at a [illegible]ent election, $543,000 being voted to [illegible]elp defray the cost.

NORTH YAKIMA, WASH.—The County Commissioners have decided to replace the Parker bridge with a modern steel bridge with concrete abutments. In the spring the Zillah bridge will be replaced by a modern structure.

PORTLAND, ORE.—Tentative plans will be prepared by Waddell & Harrington, Consult. Engrs., Kansas City, Mo., for the construction of the bridge at Ellsworth and Mead Sts. Estimated cost, about $600,000.

SAN DIEGO, CAL.—The following contracts for the construction of bridges have been awarded to KNIGHT & HYDE, San Diego, by the Board of Supervisors: Santa Margarita River bridge, $7,765; Los Flores Creek bridge, $3,352; San Onofro Creek bridge, $6,016; South San Mateo bridge, $5,310; San Mateo Creek bridge, $6,930. List of bidders noted on Dec. 22.

SANTA ANA, CAL.—Plans for the construction of a highway bridge at Newport Bay for the purpose of connecting Balboa Island with the mainland, have been prepared by S. H. Finley, Engr., Santa Ana. The structure will be 180 ft. long of concrete or concrete and steel construction.

CORCORAN, CAL.—The Board of Supervisors of Tulare County, Visalia, have decided to build a 600-ft. trestle bridge over the Tule River, south of Corcoran.

FULLERTON, CAL.—The City Trustees have instructed the City Attorney to prepare an ordinance calling a special bond election to vote $10,000 for the construction of a concrete bridge.

PLAIN CITY, UTAH.—The County Commissioners, Ogden, Utah, on Dec. 5, granted authority to the Road Supervisor, Plain City, to erect a new bridge across Dick's Creek.

SALMON, IDAHO.—The contract for the construction of the new bridge across Lemhi River, at Barracks Lake, has been awarded to E. L. EMIGH.

QUEBEC, QUE.—Bids will be received until Jan. 9, by the Quebec Harbor Commissioners, Raoul Renault, Secy-Treas., for furnishing the material and constructing a Strauss-Bascule single-track railway bridge.

Bids will be received, it is stated, until Jan. 11 by W. D. Baillairge for constructing bridge and approaches over the St. Charles River.

*QUEBEC, QUE.—It is reported that the contract for the new Quebec bridge will be given to the St. Lawrence Bridge Co., a company which will be formed, consisting of the Dominion Bridge Co. and the Canadian Bridge Co. interests, with the Phoenix Bridge Co., 410 Walnut St., Philadelphia, Pa., as the sub-contractor. The bridge is to be finished by 1915, at a cost of about $10,000,000, as against $6,000,000, the contract price for the old bridge which collapsed in 1907. Hon. William Pugsley is Minister Pub. Wks., Ottawa, Ont.

VANCOUVER, B. C.—The cost of the construction of the concrete bridge at the foot of Burrard Ave. to Kitsilano is estimated at $922,400. The cost had been erroneously estimated at $1,001,800. N. A. Clement is City Engr.

BUILDINGS.

(*Denotes that this work is advertised in Engineering News.)

BOSTON, MASS.—Bids were received as follows on Dec. 22, by James Knox Taylor, Superv. Arch. of Treasury Dept., Washington, D. C., for the construction of the Appraisers' Stores in Boston: Charles H. Peckworth, 415 Hudson St., New York, $589,000; H. P. Converse & Co., Boston, $598,700; Woodbury & Leighton, Boston, $616,173; William H. Fissell & Co., 1133 Broadway, New York, $596,400; Norcross Bros. Co., Worcester, Mass., $652,500.

Bids will be received until Jan. 3, by Charles Logue, Chn., School-House Commission, 120 Boylston St., for the construction of an elementary school in the Roger Wolcott District.

CONCORD, MASS.—Plans have been drawn for a Deaconess' hospital to be built here next spring. Rev. William F. Perrin is Pres. of the N. E. Deaconess Association, Boston.

BOSTON, MASS.—A site has been purchased for the proposed Y. M. C. A. building in Fenway. It has a frontage on Huntington Ave. of about 404 ft. and comprises 155 x 465 ft. The project will represent an expenditure of about $500,000, it is stated.

NORFOLK, MASS.—It is proposed to build an Inebriates' Hospital next year in this town. Robert A. Woods, of Boston, is Chn. of Trustees.

BROOKLINE, MASS.—Snider & Druker, 262 Washington St., Boston, contemplate the erection of a 3-story brick apartment block, containing eight suites, on Vernon and Park Sts., Brookline. The estimated cost is $120,000.

NEW YORK, N. Y.—We are officially advised that the contract to erect a 5-story building for the Hartford Fire Insurance Co., at Maiden Lane, has been awarded to the EDWARD CORNING CO., 100 William St. Butler & Rodman, 16 East 23rd St., are the Archs. Estimated cost, $40,000.

NEW YORK, N. Y.—Plans have been filed for a 3-story residence for L. M. Starr on the south side of 70th St., 225 ft. east of Madison Ave., at a cost of $50,000. It will have a frontage of 25 ft. and a depth of 68.11 ft. with a facade of granite and limestone in the old Colonial style of architecture. E. Swartwout, 224 Fifth Ave., is the Arch.

L. T. Hilton, who recently leased the vacant plot 42 × 138 ft., on the east side of Broadway, 33.6 ft. north of 94th St., has commissioned Gronenberg & Leuchtag, Archs., 3 West 42nd St., to prepare plans for a 4-story garage, with an ornamental and plate glass front. A novel feature of the building will be a roof, which will have a collapsible angle-iron cover, designed for the manufacture and exhibition of aeroplanes.

The Cave Elite Co., 1547 Broadway, a recently organized company, with a capital of $100,000, plans to construct a restaurant and hotel building at 1557-63 Broadway, on a site, 71 × 83 ft.

Plans have been filed for an 8-story brick loft building at the southwest corner of Eleventh Ave. and 45th St., known as 599 to 603 West 45th St. The building will be fireproof, with a facade of brick, and a frontage of 75 ft. on the avenue by 92 ft. in the street. John J. Rodley is the owner. William M. Farrar, 1269 Broadway, is the Arch. The cost is estimated at $120,000.

NEW YORK, N. Y.—Plans have also been filed for a 22-story and basement store and loft building, to be erected on the north side of 36th St., 255.2 ft. east of Seventh Ave. This building will be fireproof and will be equipped with three elevators. The facade will be of the modern Renaissance style of architecture. It will be constructed of terra cotta and will have a frontage of 59.5 ft. and a depth of 89.6 ft. The cost, according to the estimate of Buchman & Fox, Archs., 11 East 59th St., will be $250,000. Edward West Browning, is the owner of record.

George Fred Pelham, Arch., 507 Fifth Ave., has plans in progress for a 10-story elevator apartment house, 95 × 99 ft., to be erected by the Hamilton Grange Apartments, Inc., 2434 Broadway, at the northwest corner of Convent Ave. and 140th St. Cost, $325,000.

Neville & Bagge, Archs., 217 West 125th St., have completed plans for the 12-story apartment house to cover a plot measuring, 99 × 100.5 ft., at the southeast corner of Seventh Ave. and 54th St., to cost approximately $700,000. CHARLES E. McMANUS, 45 East 42d St., will erect the building.

George and Edward Blum, Archs., 505 Fifth Ave., are preparing plans for an 8-story apartment house for T. J. McLaughlin & Son, builders, 207 West 98th St., to be erected on the north side of 98th St., near Broadway. The building will cost approximately $150,000.

We are officially advised that plans are being prepared by William M. Bosworth, Arch., 527 Fifth Ave., for the construction of a building for the New England Society of New York. The plans are at a preliminary stage and will not be ready for estimates until some time next spring. At a recent meeting the following building committee was appointed: Austin B. Fletcher, J. Pierpont Morgan, Gen. Thomas H. Hubbard and Charles C. Burke. Estimated cost, $1,000,000.

NEW YORK, N. Y.—Plans have been filed for two 5 and 5½-story tenements on the east side of Haven Ave., 97.4 ft. south of 181st St., for the Kirby Construction Co., 135 Broadway. B. W. Levitan, 20 West 31st St., is the Arch. Cost, $120,000.

Plans have also been filed for the erection of an 8-story brick tenement, 74.11 × 84 ft., on the north side of 89th St., 150 ft. west of Broadway. The owner is the North Holding Co., 103 Park Ave., and Mulliken & Moeller, Park Ave. and 41st St., the Archs. Estimated cost, $250,000.

NEW YORK, N. Y.—Plans have been filed for building a 12-story store and loft building at 235 and 239 Lafayette St. for Dominick Astuto. The building will have a frontage of 50.1 ft. and a depth of 90 ft., with a facade of brick, limestone and terra cotta, and will be of fireproof construction. The cost has been estimated at $200,000 by William H. Birkmire, Arch., 396 Broadway.

Plans also have been filed for an 8-story apartment house on the south side of 115th St., 175 ft. west of Broadway, for the Carnegie Construction Co. The building will have a frontage of 49.11 ft. and a depth of 85.11 ft. Schwartz & Gross, Archs., 347 Fifth Ave., estimate its cost at $100,000.

Plans have been filed for a 5-story private dwelling to be erected on the east side of Park Ave., 27.6 ft. north of 73d St., known as 785 Park Ave., for Benjamin and Frances S. Welles of Islip, L. I. The dwelling is to cost $40,000, and will have a facade of limestone, with a frontage of 22 ft. and a depth of 75 ft., with an extension. Trowbridge & Livingston, 527 Fifth Ave., are the Archs.

Plans have been filed for an 8-story fireproof apartment house on the north side of 108th St., 125 ft. east of Broadway, for the 108th St. Realty and Construction Co., of which Joseph L. Grof is Pres. It will have a frontage of 74.11 ft. and a depth of 100.10 ft., with accommodations for 33 families. George & Edward Blum, 505 Fifth Ave., Archs., estimate the cost at $210,000.

Plans have been filed for erecting a 12-story brick store and loft building on the west side of Broadway, 246 ft. north of Bleecker St., known as 663 and 665, for the 663-665 Broadway Co., of which Harry Fischel is Pres., at a cost of $275,000. It will have a frontage of 50.3 ft. and a depth of 200 ft. through the block to Mercer St. The facade on the Broadway side will be of Indiana limestone and terra cotta, while the Mercer St. facade will be of brick. This building will be known as the Fischel Building. V. Hugo Koehler, 489 Fifth Ave., is the Arch.

NEW YORK, N. Y.—Bids are now being received by the George Backer Construction Co., 1182 Broadway, for the erection of a 12-story loft and office building, 40.6 × 100 ft. on West 45th St. W. L. Rouse and L. A. Goldstone, 12 West 32d St., are the Archs. Noted on Dec. 15.

The Queensboro Corporation has closed a contract with CORNMAN & LEVINE, builders, for the erection of 20 2-family houses and the same number of 3-family houses on the Elmhurst section of the Barclay-Dugro tract. The material will be face brick and Indiana limestone. Work on these houses will begin as soon as the weather will permit.

BUFFALO, N. Y.—The International Auto League Tire & Rubber Co. will at once erect a 3-story and basement brick store and warehouse at South Division and Pine Sts., adjoining its present plant.

BUFFALO, N. Y.—Plans for the proposed passenger station and terminals which the Delaware, Lackawanna & Western R. R. Co. proposes to build at the foot of Main St., this city, at a cost of $1,500,000, have been approved by the Public Service Commission of the State of New York and submitted to the Mayor and City Council for action.

The new station will be located on the east side of Main St., between Ohio St. and the Buffalo River. The main building, or station proper, will be 200 × 100 ft., with a modern type train shed, canopy covered, 650 ft. in length, six tracks wide, connected with the main structure by a large concourse. The main structure will be in the Italian Renaissance style of architecture, similar in design to the company's stations at Hoboken and Scranton. The first story will be constructed of Indiana limestone and the two additional stories of dark colored brick and tile, with roof of dark red Italian tile. The second story is to be 40 ft. in height and will contain the waiting rooms and terminal accessories, being on the same level as the tracks, which are elevated. The acceptance of the plans by the city involves the closing of the river ends of four streets, giving the railroad company 1,500 ft. of river frontage between Main and Michigan Sts., with a dock 34 ft. wide which will be used for landing and transfer facilities for passenger steamers of the various lake lines.

KINGSTON, N. Y.—The Kingston Gas & Electric Co., 608 Broadway, contemplate the erection of a 3-story fireproof office building, 100 × 100 ft., at 609-611 Broadway, to cost $40,000. The owner will prepare the plans and work will not be started before spring.

OSWEGO, N. Y.—Bids will be received in January for the construction of a 4-story fireproof hotel, 141 × 106 ft., by the Oswego Hotel Corporation, of which J. D. Higgins is Pres. George B. Post & Sons, Archs., 347 Fifth Ave., New York, prepared the plans. Estimated cost, $125,000.

ELIZABETH, N. J.—Plans and specifications have been completed by George E. Poole, State Arch., Trenton, for the proposed armory, 105.8 × 199 ft., to be erected at Magnolia Ave. and Walnut St., as a drill hall and headquarters for the Second Battalion, Second Regiment, N. G. N. J. Estimates are now being received. It will cost between $125,000 and $150,000.

JERSEY CITY, N. J.—Plans have been completed by John J. O'Neill, Arch., for a 12-family apartment house which will be built on the south side of Pavonia Ave., between Chestnut and Waldo Aves. The building will be of brick, four stories in height. Harry Hanson, 76 Cottage St., will be the owner of the building.

NEWARK, N. J.—Detailed plans and specifications for a $2,000,000 department store in Newark have been filed with the Buildings Department of that city. L. Bamberger & Co., who already have a large department store in Newark, will erect the building. The structure will be of skeleton steel construction throughout, with the exterior of ornamental terra cotta brick. There will be 18 elevators for passengers, each elevator separated from the main structure by a reinforced fire wall. The construction will be fireproof throughout. There will be approximately 405,000 sq. ft. of floor space. The site takes up all but 35 ft. of the entire frontage on Market St. The building will cover 225 ft. on Halsey St., 144 on Market St. and 116 ft. on Washington St.

CAMDEN, N. J.—We are officially advised that bids will be received until 2 p. m., Dec. 29, by the State Military Board, Trenton, for the construction of a 2-story armory, 155 × 230 ft., for Battery B, Field Artillery. George E. Poole is State Arch., Trenton. Estimated cost, $100,000.

ERIE, PA.—Joseph Lee, Arch., 2116 Peach St., is preparing plans for a 3-story and basement store and flat building, 125 × 113 ft., to be erected by R. Kunze, at the southwest corner of East Ninth and French Sts. Approximate cost, $100,000.

Bids will be received some time in January for construction of a college building with two wings, 180 × 106 ft., for the St. John Kanty College Association. There will be three or more fireproof buildings, of steel, stone, brick and tile, three stories high. Paul Rys, 456 West 13th St., is the Arch., and Rev. A. Ignasiak, Pres. Estimated cost, $150,000.

FRANKFORD (Philadelphia post-office), PA.—BURD P. EVANS has a contract to erect a $40,000 addition to the Frankford Ave. Methodist Episcopal Church, at Frankford Ave. and Foulkrod St., Frankford. The addition will be of stone, one story in height 60 × 90 ft.

HAVERFORD, PA.—Estimates are being received by Frank H. Mahan, for the construction of a 4-story apartment house at Gray's Lane and Montgomery Ave. It will be 45 × 135 ft. The property cost $60,000, and is part of the Dodson estate.

PHILADELPHIA, PA.—According to reports, the Pennsylvania R. R. Co. plans to make extensive improvements here within the next two years, including the enlargement of the Broad St. station, constructing double track bridges over the Schuylkill River, constructing a new train shed, etc. Alexander C. Shand, of Philadelphia, is Ch. Engr. Estimated cost, $6,000,000.

PITTSBURG, PA.—Dean & Stophlet, Archs., 331 Fourth Ave., has awarded to W. F. TRIMBLE & SONS, 1719 Greenwood Ave., the contract for the erection of the $100,000 warehouse for Ernest F. Rusch, to be located on Sidney St., South Side, on the former Keeling & Ridge property, which was purchased a few months ago for $50,000.

WILKES-BARRE, PA.—An apartment house, 15 stories high, and 210 × 100 ft., is to be built here, on North Franklin St., it is stated, by Robert Pettebone. Plans will be prepared by Pettebone & Ireland, Archs., Second National Bank Bldg., Wilkes-Barre. A vapor heating system will be employed. This requires a pressure of only about 46 ounces. The steam for the heating and electric current for lighting and for power purposes will be generated in a plant which will be located in a separate building at the rear of the apartment building.

WILKINSBURG, PA.—Plans are being prepared and bids will be received about Feb. 1, for the construction of a theater. It will be a semi-fireproof building, 52 × 135 ft., of steel and terra cotta. Richard Rowland, Pres., of the Pittsburg Calcium & Film Co., Fourth Ave., Pittsburg, is interested. H. C. Hodgens, Vandergrift Bldg., Pittsburg, is the Arch. The estimated cost of the structure is $50,000, and equipment $10,000.

PHILADELPHIA, PA.—The lowest bid recently received was that submitted by A. Whitehead, 1624 Latimer St., for the construction of a parish building for the Christ Church Corporation. Ralph E. White is the Arch. It will be 37 × 119 ft., four stories high, of Colonial design, and will be fireproof. Cost, $75,000.

Walter Smedley, Arch., Stephen Girard Bldg., is preparing plans for a 7-story commercial building at 623-27 Arch St., for Tracey, Morris & Co. It will be of concrete and brick. Estimated cost, $100,000.

Nessman & Brill are receiving estimates for 22 2-story dwellings on Slocum St., east of Germantown Ave., at a cost of $75,000.

George Ruhland, Fourth and Rockland Sts., is having plans prepared for the erection of 37 2-story dwellings on Ruscomb St., east of Third St., to cost $75,000.

PHILADELPHIA, PA.—The old Mechanics' Institute, at Fifth and Ellsworth Sts., will be torn down and a Carnegie library building will be erected. It will be two stories, of terra cotta and brick, 60 × 64 ft. D. K. Boyd, 139 South 15th St., is the Arch. The cost will be $50,000, which is part of $1,500,000, recently donated.

HANOVER, PA.—Herman Miller, Arch., Crozer Bldg., Philadelphia, has completed plans for two $50,000 residences at Hanover, for C. M. Myers and H. D. Sheppard.

SWARTHMORE, PA.—Paul A. and Seymour Davis, Archs., 1600 Chestnut St., Philadelphia, are preparing plans for a high school at Swarthmore. Cost, $60,000.

BALTIMORE, MD.—The plans for the proposed Polytechnic Institute on North Ave., opposite Guilford Ave., are nearing completion. They are being prepared by Baldwin & Pennington, Archs., Professional Bldg. The cost for construction alone will be about $400,000. The building will be three stories high, of brick, stone and concrete; with basement. Henry Adams is the Engr.

BALTIMORE, MD.—Walter L. Westphal, Fairmont and East Aves., contemplates the erection of 112 houses in Southwest Baltimore. Plans are being prepared by Samuel A. Bersterman, Arch. Estimated cost, $170,000.

The congregation of the West Baltimore Station Methodist Episcopal Church plans to construct a church, 60 × 90 ft., at Fulton Ave., north of Presstman St. Plans are now being prepared. Rev. John H. Howard, 1373 North Stricker St., is pastor. Estimated cost, $50,000.

CUMBERLAND, MD.—Plans have been completed by Wright Butler, Arch., 4 Water St., for the erection of a Masonic Temple here. Estimated cost, $150,000.

WASHINGTON, D. C.—A home for the international reform bureau, to cost $250,000, is to be erected at Second St. and Pennsylvania Ave., S. E. This announcement was made at a meeting of the international moral and social commission held recently. Officers of the organization were elected as follows: Henry W. Blair, Pres.; Dr. Wilbur F. Crafts, Secy.; Dr. Samuel Zane Batten of Des Moines, Corresponding Secy.; Prof. J. M. Barker of Boston, Treas., and Dr. Sylvanus Stall of Philadelphia, Auditor. The vice-presidents, representing five continents, are: Capt. R. P. Hobson of the United States; Dr. J. G. Shearer of Canada; John Newton of London, Dr. R. Herod of Switzerland, Canon Boyce of Australia and Rev. E. W. Thwing of China.

LEESVILLE, LA.—Plans have been prepared by Col. W. L. Stevens, Arch., of New Orleans, and accepted, for the school building to be constructed in Leesville.

NEW ORLEANS, LA.—The Finance Committee of the City Council received the following bids for the erection of the Girls' High School on Napoleon Ave., between Pitts and Prytania Sts., on Dec. 12: James Geary, $207,880; F. A. Nouilet & Son, $202,967; George J. Glover, $189,928; John O. Chisholm & Co., $207,800, and John Rousch, $202,000.

Plans for the proposed Boys' High School to be erected at Canal and Salcedo Sts., have been approved by the School Board. It will be a 2-story and basement structure and will cost about $200,000.

NASHVILLE, TENN.—The Board of Education has awarded the contract for erecting the proposed high school to GEORGE MOORE & SONS, of Nashville, at $219,000. The bids were received on Nov. 25.

JACKSON, TENN.—The Board of Aldermen has decided to erect a high school here, at an estimated cost of $40,000.

*BOWLING GREEN, KY.—Bids will be received by James Knox Taylor, Superv. Arch., Treasury Dept., Washington, D. C., until 3 p. m., Jan. 21, for the construction (including plumbing, gas piping, heating apparatus, electric conduits and wiring) of the U. S. post-office and court-house at Bowling Green.

COLUMBUS, OHIO.—Steps were taken recently for the construction of a $250,000 temple for the use of the Scottish Rite Masons and Aladdin Temple Shriners, of Columbus, on a lot adjacent to the present Masonic Temple, on Fourth St. The two organizations have pledged sufficient funds for the work, which will be started in the Spring.

TOLEDO, OHIO.—John N. Mockett, clothier, 217 Summit St., plans to build a store building for his business on the north 60 ft. just vacated by Tiedtke Bros. and across the street from his present store. Mr. Mockett will tear down the old building and erect a structure to cost $75,000.

TOLEDO, OHIO.—Plans have been prepared by M. M. Stophlet, Arch., Nasby Bldg., and bids will be received in February, for the construction of the Flower Hospital. There will be two fireproof buildings, 200 × 40 ft. and 60 × 30 ft., of steel and tile. Dr. E. O. Crist, 2044 Maplewood Ave., is interested. Estimated cost, $100,000.

COLUMBUS, OHIO.—It is reported that the bids for the construction of the interurban station at Columbus, for the Ohio Electric Co., were excessive and the work will be readvertised. The bids were opened Dec. 20.

The engineers of the Cleveland, Cincinnati, Chicago & St. Louis Ry. Co. have awarded the contract for the construction of a row of business rooms on the north approach of the High St. viaduct, to the ROCHE-BRUNNER CO., of Cincinnati. The contract includes the erection of a storage house for the Schwarzschild & Sulzberger Co., of Chicago. Noted on Dec. 8.

INDIANAPOLIS, IND.—A building permit has been issued to the J. H. Murphy estate to erect a 7-story mercantile building at 28 East Georgia St. The SELDEN-BRECK CONSTRUCTION CO., Fullerton Bldg., St. Louis, Mo., are the contractors. The cost of the structure will be $300,000.

GRAND RAPIDS, MICH.—Williamson & Crow, Gilbert Bldg., are preparing plans for a 10-story and basement bank and office building, 50 × 93 ft., for the Michigan Trust Co., Ottawa and Pearl Sts., Grand Rapids. The building is to be constructed of brick and steel and will be strictly fireproof. Cost, $50,000.

DETROIT, MICH.—We are officially advised that the following contracts have been awarded for the construction of a 5-story and basement warehouse and stable, 80 × 100 ft. Masonry, MARTIN BURKHEISER, Builders' Exchange; carpentry, J. MOYNES & CO.; iron and steel, WHITEHEAD & KALES. Edw. C. Van Leyen and Edw. A. Schilling, Union Trust Bldg., are the Archs., and the People's Outfitting Co., of which Henry Wineman, 42 Michigan Ave., is Secy., the owner. Estimated cost, $50,000.

PORT HURON, MICH.—The B. P. O. Elks, No. 343, of Port Huron, are having plans prepared for a $75,000 temple, to be erected in the early spring.

CHICAGO, ILL.—Plans are being prepared by Postle & Mahler, Archs., Marquette Bldg., for the construction of a fireproof mercantile building by the L. Fish Furniture Co., at 1901-13 State St. It will have a frontage on State St. of 100 ft. and a depth of 115 ft. The front will be constructed of granite and stone in the lower stories and above that, of red pressed brick of a dark color, and will be occupied, when completed, as the company's main store. Estimated cost, $200,000.

John B. Mallers, 258 Madison St., has completed plans for a 20-story office structure to be erected at the southeast corner of Madison St. and Wabash Ave. The cost is estimated at $2,250,000.

McLEANSBORO, ILL.—The Hamilton County Board is considering the erection of a new court-house, according to reports. Estimated cost, $75,000.

SIOUX CITY, IOWA.—The Great Northern Ry. Co. plans to erect a building for division offices, baggage and express rooms at Third and Pierce Sts., it is announced. R. L. Knebel, of Sioux City, is Div. Supt.

MANKATO, MINN.—Bids will be received about Mar. 1, for the construction of a motherhouse and academy to be erected by the Sisters of Notre Dame. E. Brielmaier & Sons, University Bldg., Milwaukee, Wis., are the Archs. It will be a 3-story structure with a basement and an attic. Albert Schippel, Arch., National Citizens' Bank Bldg., Mankato, will have charge of construction, we are officially advised. Estimated cost, $200,000.

ST. PAUL, MINN.—The University Club of St. Paul proposes to erect a clubhouse, to cost about $75,000 or $100,000, at the corner of Western and Laurel Aves. A building committee with James R. Mitchell as Chn., has been appointed to confer with architects. Work is expected to start in the summer of 1911.

INDEPENDENCE, KAN.—Bids will be received until 3 p. m., Jan. 26, by James Knox Taylor, Superv. Arch., Treasury Dept., Washington, D. C., for the construction, complete (including plumbing, gas piping, heating apparatus and electric conduits and wiring), of the U. S. post-office at Independence.

ST. LOUIS, MO.—Bids are asked until Jan. 10, for the construction of a sanitarium on Delmar Boulevard for the Masons of Missouri. The proposed building will be 108 × 112 ft. Ex-Gov. A. M. Dockery is Chn. of the Executive Committee of the Masonic Home Board. Other members of the Board include Ethelbert P. Allen, of Kansas City; Campbell Wells, Platte City; J. W. Boyd, St. Louis, etc. Estimated cost, $100,000.

BEEVILLE, TEX.—Bids will be received by the Commissioners of Bee County, until Jan. 9, for the construction of a court-house. Stephenson & Heidenfels, of Beeville, are the Archs.

SEATTLE, WASH.—John Graham, Arch., Central Bldg., has awarded to the VULCAN IRON WORKS the contract for furnishing the structural steel on the proposed $1,000,000 Bon Marche building. The contract consists of the delivery of 4,500 tons of steel at $340,000. Noted on Oct. 13.

SPOKANE, WASH.—Bids will be received until 3 p. m., Dec. 31, by E. A. Thomas, Secy., Bd. of Directors of Spokane School District No. 81, for the erection of a high school on the grounds of the South Central high school.

Plans have been completed by Preusse & Zittel, Archs., Jamieson Bldg., and adopted by the city for the erection of an 8-story city hall building, 140 × 142 ft., on the corner of Wall and Front Sts. Estimated cost, $500,000.

PORTLAND, ORE.—Bids are being received, we are officially advised, by Claussen & Claussen, Archs., Macleay Bldg., for the construction of an apartment house, 50 × 100 ft., four stories high, for Mrs. A. M. Williams, of Seattle, Wash. It will be of brick construction. Estimated cost, $50,000.

The contract to erect an apartment for J. N. Dezendorf has been awarded to D. MADONNA. It will be a 4-story structure, 52 × 109 ft., of brick. Claussen & Claussen, Archs., prepared the plans. Cost, $50,000.

Trowbridge & Stevens, of Denver, Colo., have purchased a plot at the southeast corner of Twelfth and Harrison Sts., for the purpose of constructing an apartment house. Cost, $40,000.

TROUTSDALE, ORE.—Plans have been submitted to the County Court for the construction of a home for the poor, on a 173-acre tract, one mile west of Troutsdale. Bridges & Webber, 541 Montgomery St., Portland, are the Archs. The main building will cover 130 × 190 ft., and will be shaped like the letter H, with a rear center wing 70 × 100 ft. The entire building will have a modern steam-heating system and ventilating plant operated from a central power station a short distance from the building. Other improvements now planned include a tuberculosis pavilion, stables and work shops. The tuberculosis pavilion is to be built at a safe distance from the main group of buildings. Plans submitted to the County Court provide for the construction of a building 180 ft. long, with the sides so arranged that during favorable weather they may be opened to admit air freely. Estimated cost, $100,000.

PORTLAND, ORE.—Plans were adopted at a recent meeting of the directors of the American Realty Co., for a 5-story fireproof apartment house which will cost $100,000. The building will occupy 100 × 100 ft., on the company's property at the corner of 21st and Johnson Sts., in the Knob Hill district. Stockholders and trustees of the company are: Samuel Connell, J. M. Leiter, A. H. Devers, I. C. Sanford, D. A. Patullo, H. Daniel, R. A. Booth, H. M. Adams, S. B. Barker, G. F. Johnson, W. W. Cotton, Gay Lombard, D. W. Campbell and T. W. B. London.

A permit has been granted to W. L. Morgan, W. A. Leith and J. W. Hecker, for a 4-story brick and concrete building, to be erected at the northwest corner of Grand Ave. and East Stark St. Cost, $70,000.

Plans for the 12-story syndicate building at Fourth and Washington Sts., drawn by Reid Bros., of San Francisco, have been discarded, and W. E. Nelson, Arch., of Portland, has been engaged to make an entirely new set. The design and appearance of the structure will be entirely changed, but the original plan of reinforced concrete construction will be kept.

SALEM, ORE.—A 5-story brick building is contemplated by the Salem Brewing Association, it is reported. The proposed structure will adjoin the present office building and main storage houses.

SAN BERNARDINO, CAL.—Anthony Biemer, Arch., of San Bernardino and Fred. Harris, Arch., of Riverside, have submitted plans to the County Board of Supervisors of San Bernardino County, for the proposed county hospital. Mr. Biemer designed an X-shaped building with a 2-story, central building and four 1-story wings of reinforced concrete construction. Estimated cost, $125,000. He also submitted plans for a 3-story structure, to cost $155,000. Mr. Harris submitted plans for a 3-story mission style building of brick, or concrete to cost $148,000. Additional plans may be called for.

LOS ANGELES, CAL.—Plans have been completed for the erection of a 1-story theater building at 316 and 324 South Main St. The permit for the construction work has been issued to Adolph Ramish, the owner. Cost, $40,000.

An 180-ft. building is planned at Eighth St. and Broadway, by Hulett C. Merritt. Plans have been completed for the proposed structure, which will have a 155-ft. frontage on Broadway. Estimated cost, including property, $1,500,000.

SACRAMENTO, CAL.—CHARLES LINDGREN & CO., Monadnock Bldg., San Francisco, has been awarded the contract for the construction of the 4-story and basement, Class A, court-house, to be erected in Sacramento. The contract price is $539,000 and includes all the work, which will be sub-let from the office of the contractors. The construction will be of reinforced concrete, with an exterior covering of terra cotta, granite, and pressed brick. R. A. Harold, Bryte Bldg., Sacramento, is the Arch. Bids were received on Dec. 5.

SAN DIEGO, CAL.—The city recently voted to construct a polytechnic school building, at a cost of $200,000. E. M. Capps is City Engr.

SAN FRANCISCO, CAL.—The following contracts have been awarded by the Board of Public Works for the construction of the Lowell high school, bids for which were received on Dec. 7: Brick work, BRANDON & LAWSON, $28,750; vacuum cleaning, PACIFIC STATES SALES CO.; plumbing, V. J. BELKNAP, $13,881. The lowest bid received for general construction was that submitted by Brown & Alcorn, $129,891, all of San Francisco. O'Brien & Werner, 1683 Ellis St., are the Archs. H. M. Walker, 1380 Filbert St., is in charge. The estimated cost of the building is $340,000, and equipment, $10,000.

PHOENIX, ARIZ.—Mayberry & Parker, Engrs., Pacific Electric Bldg., are preparing plans for a 4-sty brick office building, 87 × 78 ft., to be erected in Phoenix, for Roy S. Goodrich. It will have an elevator, steam heat and a gravel roof. Estimated cost, $40,000.

QUEBEC, QUE.—Bids will be received until Jan. 23, by R. C. Desrochers, Secy., Dept. Public Works, Ottawa, Ont., for the restoration of and an addition to the custom house at Quebec. Plans are at office of A. R. Decary, Dist. Engr., Post-office Bldg., Quebec.

MONTREAL, QUE.—We are officially advised that the contract to construct an art gallery, of Vermont marble, for the Montreal Art Association, has been awarded to the GEORGE A. FULLER CO., 111 Broadway. S. C. Sibley is Mgr. of the local office. Estimated cost, $300,000.

MONTREAL, QUE.—The Herald Co., Ltd., plans to construct a building at Craig and St. Alexander Sts., the site now occupied by the lumber yard of the E. J. Maxwell Co. It will be 80 × 150 ft., of fireproof reinforced concrete construction, seven or eight stories high. J. S. Brierley is Pres., and Fred Abraham, Secy.-Treas.

VICTORIA, B. C.—Thomas Hooper, Arch., 404 Homer St., has completed the plans for a building to replace the old Five Sisters' block at the corner of Fort and Government Sts. It will be six or eight stories in height, of steel and reinforced concrete, to cost $400,000.

WINNIPEG, MAN.—Plans are now being prepared for the Manitoba Agricultural College, to cost approximately $600,000. Address Hon. Robert Rogers, Minister of Public Works.

SASKATOON, SASK.—Currie Bros., departmental store merchants, have paid $75,000 for a site at Third Ave., and First St., upon which they will build a store in the spring.

The Provincial Government will shortly call for competitive plans for the proposed government buildings, to cost approximately $2,000,000. Address Hon. Robert Rogers, Minister of Public Works.

The Canadian Bank of Commerce has taken out a permit for an $800,000 bank building to be erected here in the spring. John Aird is Mgr.

WATER SUPPLY—IRRIGATION.

*(*Denotes that this work is advertised in Engineering News.)*

LOWELL, MASS.—The contract has been awarded to the ALLIS-CHALMERS CO., Milwaukee, Wis., it is reported, for furnishing and installing a new pump for the Centralville pumping station, at $40,700.

NEW BEDFORD, MASS.—The city has awarded the contract to the STANDARD CAST IRON PIPE & FOUNDRY CO., Bristol, Pa., for supplying c.-i. pipe and special castings for the Water Department, at $21.38 per ton for straight pipe and $46 per ton for castings. Total, $34,094. Other bidders were: Florence Iron Works, $34,675; Warren Foundry & Machine Co., New York, $34,530; U. S. Cast Iron Pipe & Foundry Co., Philadelphia, $34,168.

WATERBURY, CONN.—The Board of Public Works has purchased a tract of land on which to construct a concrete high-service distributing reservoir, which will be supplied from the low service system by a pumping plant. R. A. Cairns is City Engr.

TROY, N. Y.—Bids will be received until 11 a. m., Dec. 30, by the Board of Contract and Supply for the construction of a 6-in. c.-i. water pipe main, with specials, valves, hydrants, etc., in Spring Ave., from Linden Ave., east, about 4,300 ft.

ELIZABETH, N. J.—James H. Fuertes, Consult. Engr., is locating a water supply for the city in connection with the proposed municipal water plant.

MASONTOWN, PA.—Bids will be received until Jan. 16 by the Borough Council for constructing a water and sewer system. C. V. Cloud is Chn. Com.-in-Charge.

SOMERSET, PA.—Bids will be received until noon, Dec. 29, by the Town Council for the construction of a pipe line from the new well to the reservoir, a distance of approximately 4,600 ft. Plans and specifications with bidder's blank attached can be seen at the office of the Secretary of the Council in the Municipal Building. All bids are to be addressed to Charles I. Shaver, Secy.

BEAVER FALLS, PA.—We are officially advised that contracts will be awarded soon by the Commercial Water Co., Beaver Falls, Pa., for the construction of the dam and all necessary work for the company's project in Dry Run. John J. Taylor, Beaver Falls, is Treas. and Gen. Mgr.

WASHINGTON, D. C.—Pres. William H. Taft has approved the report of the special Board of Army Engrs. recommending the apportionment of the new $20,000,000 fund, provided by Congress, among the following reclamation projects: Salt River, Ariz., $495,000; Yuma, Ariz., and Cal., $1,200,000; Grand Valley, Colo., $1,000,000; Uncompahgree, Colo., $1,500,000; Payette-Boise, Idaho, $2,000,000; Milk River, Mont., $1,000,000; North Platte, Wyo., and Neb., $2,000,000; Truckee-Carson, Nev., $1,193,000; Rio Grande, N. Mex., Tex., and Mexico, $4,500,000; Umatilla, Ore., $325,000; Klamath, Ore., and Cal., $800,000; Strawberry Valley, Utah, $2,272,000; Sunnyside and Tieton, at Yakima, Wash., $1,250,000 and $650,000, respectively. Total, $20,000,000. The $20,000,000 is to be spent within the next five years and the interest on the loan is to be charged against the projects. The following projects, completed or nearing completion, carry a recommendation for funds from the general reclamation act sufficient only for maintenance and operation: Orland, Cal.; Carlsbad, N. Mex.; Hondo, N. Mex.; Garden City, Kan.; Kittas, Wapata and Benton units of the Yakima, Wash., project. For the following existing reclamation projects the Board of Engineers, in the report approved by the President, recommends allotments from the general reclamation fund: Missouri Pumping, N. Dak.; Bell Fourche, S. Dak.; Shoshone, Wyo.; Mindoka, Idaho; Huntley, Mont.; Sun River, Mont.; Lower Yellowstone, Mont., and Okanogan, Wash.

WASHINGTON, D. C.—Bids were received on Dec. 3 by the Bureau of Yards and Docks Navy Dept., for dry dock pumping equipment, Navy Yards, New York and Puget Sound, and Naval Station, Pearl Harbor, H. T., Specification No. 1739. Contract has been awarded to the ALBERGER PUMP CO., 140 Cedar St., New York. List of bidders noted on Dec. 8.

*FAYETTEVILLE, N. C.—The Public Work Commission has awarded the contract to the CLARENDON CONSTRUCTION CO., Wilmington, N. C., at $12,858, for the construction of a filtration plant of two filter units of 500,000 gallons daily capacity, piping, machinery, etc. John K. Strange is Engr.-in-Charge, Fayetteville. Bids were opened on Dec. 15.

CHARLOTTE, N. C.—The Barium Springs Orphanage will construct a water, light and sewerage system. Estimated cost, $8,000. Rev. George Atkinson is Chn. of Com.-in-Charge.

ROBERTA, GA.—Bids will be received by W. J. Marshall, R. F. D., Lizell, Ga., about Jan. 30, for the construction of a water-works system for Roberta.

PENSACOLA, FLA.—The City Council has authorized the extension of water mains. Estimated cost, $11,025. Frank Reilly is Mayor.

NAPOLEONVILLE, LA.—The city will make improvements to the water-works, including the installation of a pump.

SANDUSKY, MICH.—The NATIONAL CO., South Bend, Ind., has been awarded the contract for constructing water-works, sewer and an electric light plant here, at $26,000.

CHICAGO, ILL.—Bids will be received by the Department of Public Works, until 11 a. m., Dec. 31, for furnishing and delivering 9,823 tons of c.-i. water pipe; and for furnishing and delivering on certain streets approximately 192 tons of c.-i. special castings for water pipe and 50 tons of flanged pipe and special castings. B. J. Mullaney is Comr.

PARK RIDGE, ILL.—Bids will be received until Dec. 31 by Alderman Leslie C. Dole, 147 Fifth Ave., Chicago, Ill., for one belt-driven deep-well pump for use in a 10-in. bored well with double acting brass sylinder; 125 ft. of standard pipe, pumping rods, guide couplings, air chamber and discharge check valve complete, capacity to be not less than 200 gallons per min., water to be raised 100 ft. to pump forced horizontally 70 ft. and then vertically 100 ft. to tank; one 20-HP., 3-phase, 60-cycle, 220-volt motor with pulley slide rails and 40 ft. of double leather belting. The price of motor, etc., shall be given separate from price of pump. The basis of bids shall be f. o. b. Park Ridge, Illinois, and shall include the necessary tools and the services of an expert to properly install said equipment. William Kobow is City Clk.

KEITHSBURG, ILL.—The contract for the pumping plant machinery for the Keithsburg Drainage District has been awarded to the ERIE CITY IRON WORKS, represented by W. A. Day & Co., Chicago. The plant consists of two centrifugal pumps electrically driven. The Harman Engineering Co., 120 Fredonia Ave., Peoria, Ill., is in charge of the engineering work.

ATLANTIC, IOWA.—Bids will be received about March 1, for improving the electric light and power plant and combining it with the water-works. Estimated cost, $40,000. Bonds have been voted. T. E. Nichols is City Clk. Noted on Dec. 22.

SIOUX CITY, IOWA.—Bids will be received by the City Clerk until 9 a. m., Dec. 31, for 200 tons of 6 and 8-in. c.-i. pipe, Class B, and 20 tons of special castings. G. B. Healy is Supt. of Parks and Public Property.

ST. PAUL, MINN.—Dabney H. Maury, Consult. Engr., Municipal Research Comn., has submitted his report to H. P. Keller, Mayor, on the city water supply. He recommends three new wells in the low ground near Mississippi River, to be equipped with electrically-driven pumps, to cost $30,000; electric pumps for the six wells just completed at McCarron's Lake; laying a 36-in. main from the high service reservoir to Dale and Front Sts., and a 30-in. main from that point to Lexington and University Aves., to cost $150,000.

TWO HARBORS, MINN.—P. J. MacAlpine, City Clk., will receive bids until 8 p. m., Jan. 2, for the installation of a pump with a capacity of 3,000,000 gallons every 24 hours.

FORT CROOK, NEB.—We are officially advised that the lowest bidder for the construction of a reservoir and well here, bids opened on Dec. 16, was the J. W. Turner Improvement Co., 309 Youngerman Bldg., Des Moines, Iowa, at $14,000 for reservoir and $5,000 for well. The bid for both was $18,500. Bids were opened by C. E. Babcock, Constr. Q. M., U. S. A., Fort Crook.

LINCOLN, NEB.—We are officially advised that bids were received by the city on Dec. 15, for water pipe as follows: 170 tons of 16-in.; 35 tons of 12-in.; 150 tons of 6-in.; 75 tons of 4-in. and five tons of specials. Class C standard specifications: U. S. Cast Iron Pipe & Foundry Co., Chicago, Ill., $10,645; Dominick Pipe Co., Kansas City, $10,814; American Cast Iron Pipe Co., Scarritt Bldg., Kansas City, Mo., $10,464. James Tyler is Water Comr.

SUPERIOR, NEB.—J. T. Robbins, City Clk., will receive bids until 8 p. m., Jan. 6, for the construction of additions and extensions to the water-works system.

HURON, S. DAK.—Bids will be received about Feb. 1 by the city for the construction of water-works, to include a 750,000-gallon concrete reservoir, 200,000-gallon elevated tank, a 1,400-gallon per min. pumping plant. Alternate bids will be received on steam, oil engine or gas producer plant. Estimated cost, $40,000. L. P. Wolff, St. Paul, Minn., is Consult. Engr.

*BELLE FOURCHE, S. DAK.—Bids will be received at the office of the United States Reclamation Service, Belle Fourche, S. Dak., until 3 p. m., Feb. 24, for the earthwork on about 22 miles of the North Canal, involving the excavation of approximately 700,000 cu. yds. of material. For particulars address the United States Reclamation Service, Washington, D. C.; Denver, Colo., or Belle Fourche, S. Dak. R. A. Hillger is Secy., Washington, D. C.

SANDERS, MONT.—The contract has been let to A. J. SULLIVAN, Billings, Mont., for enlarging and extending the Sanders Irrigation Canal at $88,000. The Herbert Gerber Engineering Co., Billings, is in charge of the engineering work.

KANSAS CITY, MO.—Bids will be received until Dec. 29 by the Fire and Water Commissioners, E. B. Harrington, Secy., for furnishing and delivering gate valves.

FORT WORTH, TEX.—The city will vote on an issuance of about $1,000,000 of bonds for the construction of a reservoir, etc. J. D. Trammell is City Engr.

DENISON, TEX.—W. B. Berry, Supt. Water Dept., has submitted a report in which he estimates the cost of connecting Randell reservoir with the city mains, purchasing pipe and machinery, installing pumps and engine, building pump house, etc., at $56,000. Y. D. Yocum is City Secy.

HEARNE, TEX.—The city has voted bonds for the construction of water-works.

GREENVILLE, TEX.—The city has voted $50,000 of bonds for the construction of water-works system and reservoir.

FORT STOCKTON, TEX.—Charles S. Downing, Kansas City, Mo., will construct a large system of irrigation, including the installation of pumping plants, upon a tract of land near here. He has arranged for watering about 7,500 acres. The proposed irrigation system will cost about $300,000, it is stated.

WALTER, OKLA.—Bids will be received by C. A. Rees, Flynn-Ames Bldg., Muskogee, Okla., until Jan. 2, for furnishing and delivering, f. o. b. cars at Walter, c.-i. pipe, special castings, valves, hydrants; also for the construction of one steel tower, with 60,000-gallon tank, etc.

FRANCIS, OKLA.—Bids will be received by C. A. Rees, Flynn-Ames Bldg., Muskogee, Okla., until Jan. 2, for furnishing and delivering, f. o. b. cars at Francis, c.-i. pipe, special castings, valves, hydrants; also for the construction of one steel tower, with 50,000-gallon tank. Alternate bids for a 75-ft. tower, with 75,000-gallon tank will be received.

RALSTON, OKLA.—Bids will be received by C. A. Rees, Flynn-Ames Bldg., Muskogee, Okla., until Jan. 2, for furnishing and delivering, f. o. b. cars at Ralston, c.-i. pipe, special castings, valves, hydrants; also for the construction of one steel tower, with 50,000-gallon tank, etc.

YUKON, OKLA.—The city has awarded the contract to N. S. SHERMAN, JR., of N. S. Sherman Machine & Iron Works, Oklahoma City, Okla., for the construction of a water-works and sewer system. Cost, $40,000. Burns & McDonnell are Consult. Engrs., Scarritt Bldg., Kansas City, Mo.

STILLWELL, OKLA.—The city has voted $40,000 of bonds for the construction of water-works.

GUTHRIE, OKLA.—Bids will be received until Jan. 5 by A. A. Leer, City Clk., for improvements to the filtration plant including one single-stage centrifugal pump to supply wash water to filters, direct connected to an electric motor to be equipped with starting box, pump to supply 1,400 gallons of water per minute; a pressure blower direct connected to electric motor, to be equipped with starting box, pressure blower to supply 900 cu. ft. of free air at a pressure of 5 lbs. per sq. in., a complete air manifold system for two filter beds, each filter 20 × 18 ft.

COLORADO SPRINGS, COLO.—Waterworks improvements as follows are contemplated for the coming year: Concrete spillway at reservoir No. 8, with filling; raising dam of reservoir No. 2, 10 ft., at a cost of $10,059; to complete No. 4, by filling, rip-rapping and puddling, $17,225; No. 5, constructing fill-back, $3,667; repairing and cleaning Lake Lorraine, $40,650.

AZTEC, N. MEX.—The Orchard Irrigation District has let the contract to the STANDARD CONSTRUCTION CO., of Durango, Colo., for the construction of a large irrigation ditch for the district.

RATON, N. MEX.—G. H. Webster, Jr., Denver, Colo., is completing arrangements here for the construction of a 500,000-gallon reservoir, to be lined with cement and 20,000 ft. of pipe line, to bring water from Cimarroneito River to this place, a distance of seven miles.

ELLENSBURG, WASH.—The citizens have voted to construct a municipal water system. Plans have been prepared by G. S. Miller, City Engr. Noted on Dec. 22.

SPOKANE, WASH.—John Gifford, City Purchasing Agt., will receive bids until 2 p. m., Jan. 6, for 3,600 ft. of 18-in. water pipe to withstand a working pressure of 125 lbs.

PORTLAND, ORE.—Bids will be received by the Water Board until 4 p. m., Jan. 10, for furnishing and delivering at Portland the following approximate quantities of water pipe and special castings: 700 lengths of 36-in. c.-i. pipe, estimated weight, 1,300 tons; 1,000 lengths of 16-in., 745 tons; 1,000 lengths of 12-in., 485 tons; 300 lengths of 10-in., 114 tons; 10,000 lengths of 8-in., 2,575 tons; 1,000 lengths of 6-in., 190 tons.

Total weight, 5,792 tons. Special castings for c.-i. pipe, 100,000 lbs. Specifications may be obtained at the office of D. D. Clarke, Engr. Water Bd. Bidders are to state the price per ton of 2,000 lbs. and price of special castings per lb., all delivered at the Albina Yard, Portland. f. o. b.

PORTLAND, ORE.—We are officially advised that bids were received as follows on the Water Board for 200 fire hydrants: Glamorgan Pipe & Foundry Co.; Wood Iron Works Co., $7,950; Ludlow Mfg. Co., $8,040; R. D. Wood & Co., $8,200; Caldwell Bros. Co., $8,296; Eddy Valve Co., $8,700; Phoenix Iron Works, $8,900. D. Clarke is Ch. Engr. Water Dept.

*KLAMATH FALLS, ORE.—Bids were received at the office of the United States Reclamation Service, Portland, Ore., on Dec. 15, for the construction of the Lost River diversion tunnel, located from six to ten miles southeast of Klamath Falls. The work consists in constructing a concrete diversion dam, concrete, bridges, etc., and involves about 5,500 cu. yds. of concrete and 400,000 cu. yds. of excavation and embankment. The bids follow: (a) Schedule I; (b) Schedule 5: George C. Clarke, Everett, Wash., (a) $83,512; (b) $10044. McGrath Construction Co., Green Bay, Wis., (a) $112,270; (b) $11,267 (would not accept Schedule 5 without Schedule 1); Strange & McGuire, Salt Lake City, Utah, (a) $103,740.

CORONA, CAL.—The Citrus Belt Land Co. has awarded the contract to SANDERS & HACKETT of Corona, for furnishing and laying four or five miles of 6, 8, 10 and 12-in. reinforced concrete pipe to be used for irrigating 1,500 acres of land.

HOLTVILLE, CAL.—The City Trustees have awarded to H. H. PETERSON, the contract for installing pipe for the new municipal water system. HARRIS & EDWARD have contract for making excavations for settling basins. J. A. BUTTERFIELD has the contract for erecting pump and engine-house.

HEMET, CAL.—The Lake Hemet Land & Water Co., W. F. Whittier, Pres., will build a new steel pipe line in the San Jacinto Canyon.

DOUGLAS, ARIZ.—The City Engineer has recommended to the City Council the construction of a new water tower to have a capacity of 300,000 gallons, and other improvements as follows: Pumping equipment, $20,000; building, $9,800; water mains, $14,000; reservoir, $12,300; street mains, $14,700; hydrants and valves, $1,600. The pumping equipment is to consist of two oil-engines to operate two 1,000,000-gallon per day power-driven pumps.

BISBEE, ARIZ.—The Bisbee-Naco Water Co. will erect a steel water tank to have a capacity of 750,000 gallons to be used as an auxiliary water supply.

SEWERS.

*(*Denotes that this work is advertised in Engineering News.)*

BUFFALO, N. Y.—The City Council has ordered the construction of 36, 33, 30, 27 and 24-in. brick sewers and 20, 18, 15 and 12-in. tile sewers in Connelly St., Olympic, Warwick and Northumberland Aves., between Bailey and Kensington Aves. and bids for the work will be advertised for by the Commissioner of Public Works, Francis G. Ward, Municipal Bldg.

BUFFALO, N. Y.—The City Council has ordered a 10-in. tile sewer to be constructed in Worcester Place, between Kensington and Leroy Aves., and a 15 and 12-in. tile sewer in Norris St., between Hertel Ave. and the north end of the St.

NEW YORK, N. Y.—Bids were received by President of the Borough of the Bronx, for constructing sewer and appurtenances in the following streets and avenues: 1—Westchester Ave., between Zerega Ave. and Westchester Square, Westchester Square between Westchester Ave. and Walker Ave. 4—Albany Road, from Van Cortlandt Park South to Bailey Ave.; Bailey Ave., from Albany Road to Sedgwick Ave.; Sedgwick Ave., from Bailey Ave. to Fordham Road. 5—Jerome Ave., from Mosholu Parkway to the northerly line of the City. Wm. F. Murray (1) $89,061; Vinton Contracting Co. (1) $81,985; Melrose Construction Co. (1) $92,319; Leahy Construction & Contracting Co. (1) $87,501; J. C. Rodgers, Jr. (1) $107,400 (4) $181,340; P. J. Brennan Contracting Co. (1) $99,472; Aneita Construction Co. (1) $87,521; Salvator Ammanna (4) $177,371; McDonald & Barry (4) $179,557; Watson Contracting Co. (4) $157,778; Godwin Construction Co. (4) $163,192 (5) $75,232; L. E. Kelley (4) $247,164; LaMurra Contracting Co. (4) $163,875; J. B. Malestesta (5) $58,793; Antonio Civanni (5) $74,793; L. J. Moran (5) $71,088.

NEW YORK, N. Y.—Bids received Dec. 23 by the President of the Boro. of the Bronx, for regulating, grading, setting curbstones, flagging the sidewalks, building approaches and placing fences in the following streets: 1—Cromwell Ave., from Jerome Ave., to Macombe Road; 3—Boston Road, from White Plains Road to North line of City; 4—West 176th St., from Aqueduct Ave. to Popham Ave.; 2—Regulating, grading, setting curbstones, flagging the sidewalks laying crosswalks, building approaches and drains, etc., and placing fences in Mt. Vernon Ave. to East 233d St. to the northerly boundary line of the City; 5—Constructing sewers and appurtenances in Walker Ave., between Westchester Sq. and covering streets, and in Benson Ave., between Westchester Sq. and Walker Ave., and in Overing St., between Westchester Ave. and Walker Ave., and in St. Peters Ave., between Westchester Ave. and Walker Ave., and in Rowland St., between Westchester Ave., and St. Raymond Ave., and in Zerega Ave., between Westchester Ave. and Glebe Ave. and in Tratman Ave., between Zerega Ave. and Benson Ave., and in Frisby Ave., between Zerega Ave. and Walker Ave. and in Glebe Ave., between Rowland St., and Overing St. and in McClay Ave., between St. Peters Ave. and Benson Ave. J. B. Malestesta (1) $16,676 (2) $40,449 (3) $220,502; Thos. F. Murray (1) $15,534; P. J. Hane Contracting Co. (1) $16,393, (4) $9,954; Antonio Cegrelli (1) $15,722 (4) $10,097; J. C. Voorhees (1) $17,800, (4) $9,187; S. Amanna (1) $22,085 (4) $8,914; P. J. Duffy (1) $18,583 (4) $9,231; Standard Construction Co. (1) $18,224 (4) $8,234; L. J. Moran (1) $19,199 (3) $252,747 (4) $9,517 (5) $71,898; M. DiMenna Contracting Co. (1) $15,719. Jas. V. Trolissi (2) $30,518; J. C. Rogers, Jr (2) $43,310 (3) $240,082; Lamurea Contracting Co. (3) $222,201 (4) $8,676; Venton Contracting Co. (3) $243,447 (5) $75,689; Godwin Construction Co. (3) $247,882; C. W. McDonald (3) $239,476; W. F. Murray (3) $276,672 (5) $79,229; Alegro & Spalini (3) $250,228; J. Damina (4) $8,574; S. Purificago (4) $8,270; Geo. M. Dunn (5) $64,592; Leahy Contracting & Construction Co. (5) $60,934; Standard Construction Co. (5) $76,048; Melrose Construction Co. (5) $73,380; Aneita Construction Co. (5) $66,927; Alamo Construction Co. (5) $67,480; S. Ammana & Lyons (5) $68,447

SYRACUSE, N. Y.—It is reported that bids will be received until Jan. 28 for the proposed Harbor brook intercepting sewer. The plans and specifications were prepared by Engineer Glen D. Holmes and Secy. Harry Hamlin.

COLLINGDALE, PA.—A sewage disposal plant will be erected soon according to a report made by the sewer committee of Collingdale Councils. The estimated cost is about $50,000.

WAYNESBORO, PA.—A. R. WARNER has been awarded the contract to install a 903 ft. sewer in the Gilberton tract.

GAFFNEY, S. C.—PORTER & BOYD, Charlotte, N. C., has been awarded the contract for the construction of two proposed sewage disposal plants. The estimated cost is $9,000.

ATLANTA, GA.—Bids received by the city for the construction of the Peachtree Creek Disposal Works are as follows: Nichols Construction Co., Atlanta, Ga., $235,646; Piedmont Construction Co., Atlanta, $208,657; Hard & Worm, New York, $208,105; CHESTER A. DADY, Brooklyn, $195,383; Municipal Engineering & Construction Co., Chattanooga, Tenn., $247,344.

Bids received by the city for the five sections of the intercepting sewer are as follows: C. W. Lane & Co., Inc., Atlanta, Ga., Sect. 4 (monolith) $50,730, (reinforced) $49,732; Sect. 5 (monolith) $56,475, (reinforced) $56,425; Sect. 6 (monolith) $55,517, (reinforced) $55,487; Sect. 7 (monolith) $44,150, (reinforced) $44,590; Sect. 8 (monolith) $53,349, (reinforced) $52,235. Noll Construction Co., Chattanooga, Tenn., Sect. 4 (monolith) $57,899, (reinforced) $50,886; Sect. 7 (monolith) $55,177, (reinforced) $48,990; Sect. 8 (monolith) $50,062, (reinforced) $51,912. Wright & Wadley Co., Macon, Ga., Sect. 4 (monolith) $44,410, (reinforced) $43,900; Sect 5 (monolith) $51,823, (reinforced) $50,889; Sect. 6 (monolith) $48,839, (reinforced) $50,767; Sect. 7 (monolith) $39,725, (reinforced) $41,773; Sect. 8 (monolith) $50,980, (reinforced) $49,637. Piedmont Construction Co., Atlanta, Ga., Sect. 4 (monolith) $47,805, (reinforced) $42,870. Nichols Contracting Co., Atlanta, Ga., Sect. 4 (monolith) $35,882, (reinforced) $38,770; Sect. 5 (monolith) $44,389, (reinforced) $46,197; Sect. 6 (monolith) $43,327, (reinforced) $45,977; Sect. 7 (monolith) $33,851, (reinforced) $36,651; Sect. 8 (monolith) $38,448, (reinforced) $40,828. Chester A. Dady & Co., Brooklyn, N. Y., Sect. 4 (monolith) $48,861, (reinforced) $53,586; Sect. 5 (monolith) $56,863, (reinforced) $60,515; Sect. 6 (monolith) $62,936, (reinforced) $67,136; Sect. 7 (monolith) $42,861 (reinforced) $47,249; Sect. 8 (monolith) $54,643, (reinforced) $59,414. Dysard Construction Co., Atlanta, Ga., Sect. 4 (monolith) $35,547, (reinforced) $45,491; Sect. 5 (monolith) $48,633, (reinforced) $53,610; Sect. 6 (monolith) $43,652, (reinforced) $52,048; Sect. 7 (monolith) $50,547, (reinforced) $53,222; Sect. 8 (monolith) $56,371, (reinforced) $57,951. F. J. McGuire, Norfolk, Va., Sect. 1 (monolith) $42,931, (reinforced) $45,031. D. M. Rosser, Engineering & Construction Co., Wilkesbarre, Pa., Sect. 4 (monolith) $47,523, (reinforced) $53,505 and $50,673; Sect. 5 (monolith) $58,063, (reinforced) $60,361 and $62,553; Sect. 6 (monolith) $56,571, (reinforced) $60,471; Sect. 7 (monolith) $45,844, (reinforced) $48,917 and $51,544; Sect. 8 (monolith) $50,738, (reinforced) $45,338 and $48,200. H. C. Miller & Sons Co., Louisville, Ky., Sect. 4 (monolith) $62,248, (reinforced) $48,073; Sect. 5 (monolith) $64,985, (reinforced) $54,027; Sect. 6, (monolith) $69,471, (reinforced) $56,871; Sect. 7 (monolith) $55,708, (reinforced) $42,545; Sect. 8 (monolith) $63,132, (reinforced) $48,822. James Ferry & Sons, Pittsburg, Pa., Sect. 4 (monolith) $57,154, (reinforced) $54,100; Sect. 5 (monolith) $67,703, (reinforced) $65,542; Sect. 6 (monolith) $60,371, (reinforced) $64,771; Sect. 7 (monolith) $61,088 (reinforced) $58,640; Sect. 8 (monolith) $70,475, (reinforced) $76,855. H. C. McBride, Carlinville, Ill., Sect. 8 (monolith) $45,022, (reinforced) $43,746. The contract for Sect. 4 was awarded to DYSARD CONSTRUCTION CO., Atlanta, Ga. (monolith) $35,547. The contracts for Sects. 5, 6, 7 and 8 were awarded to the NICHOLS CONTRACTING CO. (monolith) at Sect. 5, $44,399; Sect. 6, $43,327; Sect. 7, $33,851; Sect. 8, $38,447. R. M. Clayton, is City Engr.

LEXINGTON, KY.—Plans and specifications are being prepared in the City Engineer's office for the lateral sewers which will be installed by the Board of Pub. Wks., in the spring in the territory south of the Louisville and Nashville tracks to the city limits. Bids will be advertised for about Feb. 1.

CIRCLEVILLE, OHIO.—Bids will be received until Jan. 3, by J. W. Lowe, Dir. of Public Service, for the installation of a sewer in Court St.

LORAIN, OHIO.—Bids will be received by the Director of Public Service until noon Jan. 4, for furnishing the necessary labor and material for the installation of a sewer in Indiana Ave. and from E. Erie Ave. to F. St., E. 29th St. L. B. Johnson is Clk.

MARIETTA, OHIO.—An ordinance has been passed by the Council authorizing the installation of a sanitary sewer in the northern part of the city on upper Fifth, Sixth, Seventh, Montgomery, Marion and Fulton Sts.

SPRINGFIELD, OHIO.—Surveys are being made by Ch. Engr. M. J. Babin and his corps of engineers on the proposed trunk sewer, which is to relieve the southern section of the city. Other sewers which will be started in the spring are: Fremont Ave., between Limestone and Clifton Ave., Pearl, Fremont, Clifton Ave., Rose and Catherine Sts. in one chain of sewers; another chain in the West end, Walter, Snyder, Malden Lane, Western Ave. and Cedar St., Cedar and Lowry Ave., drain; Innisfallen Ave., between Jackson and Yellow Springs St.; Light St., Main to Columbia St.

NILES, OHIO.—The city council has adopted resolutions declaring it necessary to construct four miles of sanitary sewers in what is known as district No. 4.

NEW PHILADELPHIA, OHIO.—The city council has adopted resolutions declaring it necessary to construct a number of sewers and a sewerage disposal plant for the city. The main sewers are to be constructed in 1911, the connection sewers in 1912 and the sewage disposal plant in 1913.

COLUMBUS, OHIO.—A resolution was adopted by the city council declaring it necessary to construct a sewer in the alley west of Neil Ave., from Tompkins St. to the alley north of Blake Ave.

KALAMAZOO, MICH.—The contract has been awarded by the City Council to JOHNSON & VAN DYKE for the installation of the Tulford St. sewer at $14,919, with $25 additional for each manhole. The other bidder was Richard Heysiek, $16,412.

KENOSHA, WIS.—At a recent meeting of the common council it was decided to construct a new trunk line sewer. Bids will soon be received for such a sewer for both brick and concrete, with provisions for an 8½ ft. or a 10-ft. sewer. Bonds to the extent of $50,000 will be issued to insure the commencement of the project.

MINNEAPOLIS, MINN.—See item under Miscellaneous Contracts—Paving Blocks, Cement, etc.

BEEVILLE, TEX.—Negotiations are pending for letting the contract for the construction of a complete sewer system for this town to Messrs. Rees & Peters of San Antonio. Bonds for the proposed municipal works were voted some time ago.

CORSICANA, TEX.—Bids will be received until 6 p. m., Jan. 3, by Walter Burgess, City Secy., for the construction of about 13,200 ft. of additional sewer mains. Plans and specifications on file in the office of City Secy.

HONEY GROVE, TEX.—S. D. Duff and J. H. Whatley, Greenville, Tex., have been granted a franchise by the city to install a sewer system. The estimated cost is $20,000.

HOUSTON, TEX.—Plans are in the course of preparation for the installation of a storm water lateral along McGowen Ave., from Main St. to connect with the Austin St. sewer.

YOAKUM, TEX.—The city council of Yoakum is arranging for the construction of a sewer system here.

GALVESTON, TEX.—It is reported that the city will install 15-in. vitrified-pipe drain in Ave. P, from 21st to 23d St. A. T. Dickey, is City Engr.

CORPUS CHRISTI, TEX.—F. L. Lovcoshire of Dallas has been employed by the city council of Corpus Christi to prepare the plans for the proposed sewer system and disposal plant for this place. The initial expenditure for the public works will be $75,000.

EL CAMPO, TEX.—The city council has let the contract for the construction of a sewer system and disposal plant here to HICKS & LEHLAND, El Campo.

HONEY GROVE, TEX.—J. H. Whatley and Dr. Sam C. Duff of Greenville, Texas, will construct a system of sewers and disposal plant here. The city council has granted them a franchise for the proposed works.

DUNCAN, OKLA.—The City of Duncan, Okla., will vote bonds in Janutry for $45,000 for the construction of a system of sanitary sewers, including disposal plant, and for the extension of the present waterworks system. Two deep wells are at present in the course of construction, and a good supply of water is assured. The city will later take up the proposition of paving the business district. W L. Benham is Consult. Engr., 714-716 Campbell Bldg., Oklahoma City, Okla.

PORTLAND, ORE.—The contract for the construction of the Holgate St. extension has been awarded to PAQUET GIEBISCH & JOPLIN at $104,353. The engineers estimate was $102,578.

OAKLAND, CAL.—The HUTCHINSON CO. has been awarded the contract for the construction of a sewer in Grand St., between Clinton and Day Aves. The bid was 38 cts. a lineal ft. for 6-in. pipe and 60 cts. each for 6-in. Y branches.

LOS ANGELES, CAL.—The following contracts were awarded by the Board of Public Works. For constructing a sewer in Western Ave. awarded to JOHN GENILLA, at $9,250; for sewer work in Hope St., awarded to JOHN BALCH & CO.; for improving Rosa Court, awarded to JONES BROS., at $3.25 per lin. ft., for grading and graveling, 33 cts. per lin. ft., cement curb, 15 cts. per sq. ft., cement gutter; for sewer construction in Alvarado St., awarded to RADISCH & ZERNLICH, at $10,755.

SAWTELLE, CAL.—Preliminary plans for a system of storm and sanitary sewers, will be ordered soon by the city trustees. Estimated cost, $75,000.

SANTA PAULA, CAL.—The board of Trustees have awarded the contract to M. N. MLAGENOVICH, 332 Leroy St., Los Angeles, at $28,983 for the construction of the municipal sewer system. The approximate amounts of material are: 34,532 lin. ft. 6-in. vitrified sewer pipe and 829 Ys, 9,812 ft. 8-in. vitrified pipe and 208 Ys, 3,131 ft. 10-in. vitrified pipe and 87 Ys, 1,775 ft. 12-in. pipe and 20 Ys, 2,750 ft. 15-in. pipe and 1 Y, 38 brick flush tanks, 77 brick manholes, 1 septic tank. Olmstead & Gillelen, Engrs., Wright & Callender Bldg., Los Angeles.

SAWTELLE, CAL.—Plans are being prepared for the installation of a storm and sanitary sewer system. The estimated cost is about $75,000.

OAKLAND, CAL.—The contract has been awarded to C. W. CROSS, for the installation of a storm water sewer in Wilson and Laguna Ave., and Hopkins St., at $7,613. F. C. Turner is City Engr.

MONROVIA, CAL.—Plans have been prepared by Olmstead and Gillelen, Wright & Callender Bldg., Los Angeles, and the city trustees will call for bids soon, for the construction of a municipal sewer system. The sum of $120,000 is available for the work. There will be a total of over 30 miles of sewer, ranging in size from 6-in. to 24-in. in diameter. Bids will be received for furnishing the labor and material necessary to complete the entire work, and also in the labor and material separately. Vitrified pipe will be used for all the sewer except the 24-in. on which bids will be received for both vitrified and reinforced concrete pipe. The approximate quantities of pipe required are as follows: 118,000 ft. of 6-in. pipe and 3,350 Ys, 10,000 ft. of 8-in. pipe and 160 Ys, 6,500 ft. of 10-in. with 186 Ys, 3,160 ft. of 12-in. with 50 Ys, 1,200 ft. of 14-in. with 16 Ys, 4,000 ft. of 16-in. with 63 Ys, 9,700 ft. of 24-in. with no Ys, 229 brick manholes, 67 flush tanks.

LOS ANGELES, CAL.—The following contracts have been awarded for sewer work; to RADISCH & ZARNIKOW for constructing a sewer on Alvarado St., $10,755; to JOHN GENILLA for constructing a sewer on Western Ave., $9,250.

SALT LAKE CITY, UTAH.—Bids will be received until 7.30 p. m., Dec. 30, for installing a pipe sewer in sewer extension No. 286 in Strongs Court north from Fourth, south, between Eight and Ninth East St., according to plans in the City Engineer's office. H. G. McMillan is Chn. Bd. Pub. Wks.

NORTH VANCOUVER, B. C.—The city clerk will receive bids until noon, Jan. 3, for the construction of sewers in the city and the supply of the necessary material. George S. Harris is City Engr.

GARBAGE DISPOSAL.

*(*Denotes that this work is advertised in Engineering News.)*

ROCHESTER, N. Y.—Plans for two styles of incinerating plants will be considered by E. A. Fisher, City Engr., with a view of evolving plans and specifications for the construction of the proposed Rochester plant. The plans are to be received from the De Carrie Co., Minneapolis, Minn., and the Power Specialty Co., New York. The plans of the De Carrie Co. will be for a water jacket plant, and the New York concern will send the details for the construction of a brick incinerator. The best features of both systems will probably be incorporated in the plans for the Rochester plant. The Common Council has appropriated $100,000 for the local incinerating plant and $15,000 has been spent for a site on the river flats. The plant, if is estimated, can be built for the remaining $85,000. It is planned to dispose only of rubbish in the Rochester incinerator, but the plant will be constructed so as to dispose of the garbage in the event of the present garbage disposal system proving unsatisfactory at some future time. Actual work on the incinerator cannot be commenced before next spring, although in the meantime plans will be perfected and bids asked.

NEW YORK, N. Y.—Bids were received by William H. Edwards, Comr. of Street Cleaning, on Dec. 23, for the performance and completion of an abandoned contract for furnishing all the labor and materials required for the removal of snow and ice during the winter season of 1910-1911, Boro. The Bronx: The 146th St. Co., 43¾ cts.; Joseph Marone, 47 cts.; Kane Contracting Co., 70 cts.

SCHENECTADY, N. Y.—Dr. Charles F. Clowe, Health Officer, in his annual report to the city, has recommended the construction of a garbage disposal plant.

PHILLIPSBURG, N. J.—On Dec. 13 the Town Council awarded to M. F. SLEIGHT the contract for the installation of a municipal garbage system at $10,400.

CUMBERLAND, MD.—Bids will be received until Jan. 3 by Ward M. Eichelberger, Comr. Pub. Wks., for collecting and disposing of garbage, refuse, ashes, etc.

ATLANTA, GA.—Bids were opened on Dec. 16 by the Board of Health for collecting and disposing of garbage, ashes and refuse. The West Transfer Co. bid for this work $153,825 per year.

DENVER, COLO.—An appropriation of $90,000 for sprinkling the city streets during 1911 has been asked for by Thomas Phillips, Supt. Highway Dept. It is proposed to establish 13 new sprinkling districts on Jan. 1. This will necessitate the purchase of ten new sprinklers.

STREETS AND ROADS.

*(*Denotes that this work is advertised in Engineering News.)*

SPRINGFIELD, MASS.—The Board of Public Works plans to construct a new street from the corner of Mill St and Belmont Aves. south of Mill River to Dickinson St. The City Council is in charge. Estimated cost, $21,000.

BOSTON, MASS.—It is the purpose of the Massachusetts Highway Commission, Harold Parker, Chn., to spend $500,000, in 1911, for new roads. In addition to this, $200,000 will be spent for maintenance, in addition to the net revenue from licensing automobiles, probably $300,000, also for maintenance. The policy of completing the principal thoroughfares will be continued, especially the highways from Greenfield to Springfield; the

road connecting Boston with Keene, N. H., the highway leading from Boston through the Albany road at Lebanon, N. Y., and a number of small breaks still remaining will also be made up.

EAST PROVIDENCE, R. I.—Bids will be received by the Iowa Council, until 7.30 p. m., Jan. 4, for furnishing and delivering 182,000 granite paving blocks. George M. Hull is Pres. and William E. Smyth, Clk.

HARTFORD, CONN.—Negotiations which have been in progress for several months between James H. MacDonald, State Highway Comr., and the New York, New Haven & Hartford R. R. Co., for the elimination of two dangerous grade crossings at East Litchfield, Conn., on the main trunk line between Waterbury and Canaan, have resulted in definite plans being prepared for the prosecution of the work. The state is to construct a new highway on the east side of the railroad tracks, involving much heavy cutting and filling. Of this new highway, 3,100 lin. ft. will be in the town of Litchfield and 732 lin. ft. in the town of Harwinton. The state will also participate in the cost of the abutments of the bridge which will carry the highway over the river. In addition to this, the railroad company is to construct a bridge over its tracks and approaches to the connecting roads. Bids for the construction of the new highway will be received at the office of the State Highway Commissioner, Capitol, Hartford, until 2 p. m., Dec. 30. Plans and specifications are with W. J. Barber, First Selectman, Campville, Conn.

HARTFORD, CONN.—Bids for state road work will be received at the office of the State Highway Commissioner, Capitol, until 2 p. m., Dec. 30, as follows:

Town of Canton, 6,123 lin. ft. of gravel road on the main highway from Hartford to Winsted. This work contemplates heavy cutting and filling and will eliminate Indian Hill, so-called. The plans call for a reinforced I-beam culvert, with an 18 ft. span. Plans and specifications are with H. A. Parish, First Selectman, Collinsville, Conn.

Town of Brooklyn, 5,050 lin. ft. macadam road on Main St. Plans and specifications are with A. B. Webb, First Selectman, Brooklyn.

Town of Preston, 7,825 lin. ft. grading on the North Stonington Road, including a concrete slab culvert with an 8-ft. span. Plans and specifications are with A. E. Shedd, First Selectman, Preston.

Town of Sterling, 21,520 lin. ft. gravel road running from the Sterling Station to the Rhode Island line. Plans and specifications are with B. C. Parkhurst, First Selectman, Sterling.

Town of New Fairfield, 4,165 lin. ft. graded road. Plans and specifications are with Norris Hatch, First Selectman, New Fairfield.

NEW YORK, N. Y.—Bids will be received until 2 p. m., Jan. 5, by George McAneny, Pres., Boro. of Manhattan, for repairing and maintaining sheet asphalt pavements in the Boro. of Manhattan.

The following bids were received on Dec. 22, by the Department of Parks, for repairing asphalt pavement on a concrete foundation the roadway of Eastern Parkway extension and Glenwood Ave., Boro. of Brooklyn. Barber Asphalt Paving Co., 30 Church St., $8,305; Uvalde Asphalt Paving Co., 1 Broadway, $7,305; The Cranford Co., 52 Ninth St., Brooklyn, $8,662.

NEW YORK, N. Y.—See item under Sewers.

*ALBANY, N. Y.—Bids are asked by the State Highway Commission, Albany, until 1 p. m., Jan. 9, for improving highways, list of which is given in advertisement.

MAMARONECK, N. Y.—The village Board of Trustees at a meeting held recently decided to purchase a strip of land 15 ft. wide on the westerly side of Mamaroneck Ave., below Prospect Ave., in front of the properties of Mrs. Elizabeth H. Boyd, Mrs. Annie D. Wurster and Charles M. Baxter, to be used in widening the avenue. The proposed improvement will cost $5,000.

MT. PLEASANT, N. Y.—The Town Board of Mount Pleasant has awarded the contract for improving Columbus and Commerce Aves. to MOLLO & MURRAY, of Yonkers, at $45,000.

NEWARK, N. J.—Bids will be received by the Board of Street and Water Commissioners until Dec. 29, for grading, curbing and flagging the south of Herbert Pl., from Washington Ave. to Riverside Ave. The quantities on which bids will be received are as follows: 600 cu. yds. embankment; 1,110 ft. 20 × 4 in. four cut curb, set in concrete; 1 set 20 × 4-in., four cut corners, set in concrete; 100 lin. ft. old curb reset and four cut; 1,000 sq. ft. flagging, 6 ft. wide; 500 sq. yds. trap rock gutter paving. M. R. Sherrerd is Ch. Engr.

*SALEM, N. J.—Bids will be received by the Road Committee of the Board of Chosen Freeholders of the County of Salem, until 10.30 a. m., Jan. 11, at the Court House, Salem, for grading and placing gravel and oyster shell surface on the Mannington, Pilesgrove and Woodstown road (5.05 miles) in the townships of Mannington and Pilesgrove and the Boro. of Woodstown, Salem County.

SCRANTON, PA.—According to Engineer Arthur W. Long, of the State Highway Department, twelve miles of state roads were built in Scranton during the year which is now closing. Plans and specifications and estimate of cost for 36 additional miles of state road have been prepared. Four miles in Lackawanna, nine miles in Monroe, ten miles in Susquehanna, three miles in Pike, eight miles in Wayne and two miles in Wyoming County complete the list of the improvements contemplated. In addition to this work and the maps completed 3,600 miles of road have been surveyed. The total expenditure for building state roads in this district during the last four years was $257,654. Wayne county leads with fifteen miles of completed state road. Lackawanna has two and a half miles of state road.

PORTSMOUTH, VA.—The contract for the construction of about 80,000 yds. of street paving in Portsmouth, next spring, has been awarded to the BARBER ASPHALT PAVING CO., Land Title Bldg., Philadelphia, Pa. The bid was $1.73 per sq. yd., and the specifications require that an average of 1½-in. of Trinidad lake asphalt shall form the surface of the pavement.

JACKSONVILLE, FLA.—It is proposed to construct a hard surface road between Jacksonville and Miami. The Board of Trade is in charge.

TAMPA, FLA.—Bids will be received by C. M. Knott, Clk., Bd. of County Commissioners, until 2 p. m., Jan. 3, for furnishing a road roller, scarifier and grader.

NEW ORLEANS, LA.—A national highway to connect New Orleans and San Francisco is contemplated by the government, according to reports. Arthur C. Jackson is Pres., of the National Good Roads Association.

CANTON, OHIO.—Resolutions have been adopted by the City Council declaring it necessary to improve McKinley and Arlington Sts. P. H. Weber is City Engr.

The estimated cost of improving Sharb St. in the City of Canton is $23,693; Bellvue Ave., $6,211; Dewalt St., $575; Fourth St., $5,362, and Tenth St., $10,360.

LAKEWOOD, OHIO.—Bids will be received by B. M. Cook, Clk., of the Village of Lakewood, at the Town Hall, until noon, Jan. 16, for furnishing labor and material necessary for paving Gladys, Rosewood and Sloane Aves., and Thoreau Road.

JEFFERSON, OHIO.—Bids will be received at the office of the County Commissioners, until Jan. 3, for grading and macadamizing a road one mile long in Saybrook Township, Ashtabula County, under the provisions of the State Highway Law. Plans and specifications are on file at the office of the county commissioners. The estimated cost of the work is $12,423.

A petition has been filed with the Board of County Commissioners to pave, with brick, the road from Conneaut to Amboy, a total distance of three miles.

MASSILLON, OHIO.—The City Council is considering the advisability of repaving East Main St., from Mill St., to Erie St.; and the paving of Duncan, Erie, Mill and Cherry Sts.

TIFFIN, OHIO.—A petition has been filed for macadamizing Miami and Will St., in the city of Tiffin. Charles J. Peters is City Engr., and Edward Kuhn, Supt. Paving.

WOODSFIELD, OHIO.—Bids will be received until Dec. 31, at the office of the Board of County Commissioners, of Monroe County, for grading and macadamizing a road one mile in length in Center Township, under the provisions of the State Highway Law. The estimated cost of the work is $9,311. J. C. Wonders, of Columbus, is State Highway Comr.

MARION, IND.—The Board of Commissioners of Grant County have granted a petition for the construction of a macadam road on the line between Center and Franklin Townships. The length of the road is 4,480 ft. The roadway is to be paved to a width of 24 ft. with crushed stone.

WILLIAMSPORT, IND.—The Commissioners of Warren County have awarded contracts for the construction of gravel roads to W. W. VRANE, of Hendrick, and to D. H. FATOUT, of Indianapolis.

INDIANAPOLIS, IND.—The Board of Park Commissioners has passed resolutions for the construction of a boulevard along Pleasant Run, from Beecher St. to Shelby St. The estimated cost is $80,000. H. W. Klausman is City Engr.

RUSHVILLE, IND.—The Board of Commissioners of Rush County will receive bids until 2 p. m., Jan. 11, for the construction of a macadamized road in Anderson Township, petitioned for by J. A. Brown and others. Jesse M. Stone is County Audr.

FRANKFORT, IND.—The Commissioners of Clinton County will receive bids until 2 p. m., Jan. 7, for the construction of four gravel roads. Charles F. Cronwell is County Audr.

WINAMAC, IND.—The Commissioners of Pulaski County are asking for bids until 10 a. m., Jan. 3, for the improvement of two public highways. Ellis S. Rees is County Audr.

EAST ST. LOUIS, ILL.—Bids are asked until noon, Jan. 5, by the Board of Local improvements, for improving Linden Ave., from the easterly line of 38th St. to the Westerly line of 40th St. Also for improving 40th St., from the northerly line of Waverly Ave. to the northerly line of Forest Boulevard, and Forest Boulevard from the easterly line of 40th St. to the easterly limits of the City. Silas Cook, is Pres., and Frank B. Hanna, Clk.

ROCKFORD, ILL.—The city is planning to macadamize 13 miles of streets, it is stated. Address the City Clk.

BELOIT, WIS.—The city will issue $23,000 worth of bonds to cover the expense of building permanent pavements in the city. R. R. Caldwell is City Engr.

MILWAUKEE, WIS.—It is reported that as a result of an opinion given out by Clifton Williams, Asst. City Attorney, that when the time limit of a contract expires, the contract cannot be extended until the next season, 43 paving contracts for work aggregating $100,000, will be readvertised for by Harry E. Briggs, Comr. of Pub. Wks.

ASHLAND, WIS.—A macadamized road through the state from Ashland to Milwaukee is the project which Julius Thielman, of Merrill; R. C. Thielman, of Tomahawk, and others residing in the Wisconsin River Valley, have started.

CEDAR RAPIDS, IOWA.—The McCARTHY IMPROVEMENT CO., of Davenport, has been awarded the contract for constructing certain asphalt roads, after an action in court. Cost, $40,000.

MINNEAPOLIS, MINN.—See item under Miscellaneous Contracts: Paving Blocks, Cement, etc.

CROOKSTON, MINN.—Two bids were received as follows on Dec. 13 by the City Council, for paving, with asphalt, Ash St., from the Central High School to Houston Ave., and East Third St., from Broadway to Elm St.: P. McDonnell, of Duluth, at $2.20 per yd., with concrete "A" and $1.90 using concrete "B," including 3-in. tile drains and other changes in manholes, etc.; The General Construction Co., of Minneapolis, at $2.38 per yd., with concrete "A" and $2.13 with concrete "B," as specified, including the other work mentioned above.

TOPEKA, KAN.—The City Commissioners recently recommended resolutions providing for the paving of 45 blocks, next year. W. G. Tandy is Supt. of Paving and W. S. Fulton, City Engr.

EL PASO, TEX.—We are officially advised that the contract for paving South Santa Fe St. with bitulithic has been awarded to the TEXAS BITULITHIC CO., of El Paso, at $14,084. Bids were received on Dec. 15 by the City Council.

NORTH YAKIMA, WASH.—The City Council plans to expend about $565,000 for paving about eight miles of streets next year. Noted on Dec. 8.

LONG BEACH, CAL.—Proceedings were started at a recent meeting of the City Council for the opening of American Ave., from the south line of East Ocean Ave. to the high-tide line. The cost of this work is variously estimated from $75,000 to $125,000. It is proposed to have ornamental stairways of concrete from Ocean Ave. to the strand, and ultimately to have a pier extending into the ocean at the foot of American Ave.

LOS ANGELES, CAL.—C. M. Myers and Anna E. Becker have awarded the contract to LOUISE STANARD for grading and excavating on Osego Park tract and laying curbs, sidewalks and gutters and oiling and rolling Eagle Rock Road at 15 cts. per cu. yd. for excavating, grading and moving material; 24 cts. per lin. ft. for curbing; 8 cts. per sq. ft. for sidewalk; 12 cts. per sq. ft. for gutters; 1½ cts. per sq. ft. for oiling, trimming and sanding and rolling streets. Joseph Hurley is Engr., Los Angeles.

The County Board of Supervisors of Los Angeles County has received the following bids for improving a portion of Valley Road: George A. Rogers, Stimson Bldg., for grading and culverts on Section 1, $5,500; Section 2, $2,500; oil macadam paving, $1.45 per ton; Class A concrete, $14 per cu. yd.; Class C, $11; reinforcing steel, 5 cts. a lb.; Oil Macadam Paving Co., grading and culverts, Section 1, $9,411; Section 2, $4,162; oil macadam paving, Section 1, $1.75 per ton; Section 2, $1.49 per ton; Class A concrete, $18 per cu. yd.; Class C, $16; steel, 6 cts. Approximately 16,468 tons of oil macadam paving will be required on Section 1, and 7,549 tons on Section 2.

LOS ANGELES, CAL.—The Board of Public Works has awarded the contract to the BARBER ASPHALT PAVING CO., Central Bldg., for improving Pasadena Ave., from Ave. 18 to Ave. 50, and in other streets at the following prices: 16.08 cts. per sq. ft. for asphalt paving; 25.09 cts. per sq. ft. for brick paving; 25.09 cts. per sq. ft. for vitrified brick gutters; 30 cts. per lin. ft. for cement or asphalt curb paving; $1.10 per lin. ft. for curb with angle iron facing; $510.19 for steel concrete culvert at Ave. 19; $260.63 for vitrified pipe culvert at Ave. 23; $209.55 for same at Ave. 31; $5,407 for storm sewer in Pasadena Ave. and Ave. 35; $13,797 for same in Pasadena Ave. and Ave. 37; $3,168 for same in Pasadena Ave. and Ave. 43; $13,315 for same in Pasadena Ave. and Woodside Drive; 2,414 for culvert and sewer in Arroyo del Cal, and $669.87 for storm sewer in Pasadena Ave. and Ave. 26. Aggregate amount, $149,285.

B. C. NICHOLS has been awarded the contract for improving Hartford Ave. at 25 cts. per sq. ft. for asphalt paving, $2.85 per lin. ft. for grading and graveling, 35 cts. per lin. ft. for cement curb, 15 cts. per sq. ft. for cement gutter, 35 cts. per sq. ft. for vitrified block gutter. John Balch (A) 32 cts., (B) 11½ cts., (C) no bid. David Joy, (A) 35 cts., (B) 12 cts., (C) 35 cts. P. Heim, (A) 35 cts., (B) 12½ cts., (C) $1.50.

For improving Ave. 18, Paul H. Ehlers proposed 29.7 cts. per lin. ft. for cement curb, 9.7 cts. per sq. ft. for sidewalk. David Joy, 35 cts. and 11 cts. P. Heim, 34 cts and 12½ cts. and $1.50 per lin. ft. for asphalt wearing surface for curbs.

LOS ANGELES, CAL.—The following bids for street improvements have been received by the Board of Public Works: For improving Elmyra St., H. H. Curtis, 30 cts. per lin. ft. for cement curb, 9.07 cts. per sq. ft. for sidewalk; Paul H. Ehlers, 29.07 cts. per lin. ft. for cement curb, 9.07 cts. for sidewalk; David Joy, 33 cts. and 10.05 cts.

For improving Bonita Pl., F. E. Low, (A) $2.40 per lin. ft. for grading and graveling complete, (B) 37 cts. per lin. ft. for cement curb, (C) 18.05 cts. per sq. ft. for cement gutter, (D) 34 cts. per sq. ft. for vitrified block gutter; H. O. Richwine, (A) $3, (B) 37 cts., (C) 17 cts., (D) 35 cts.; M. S. Cummings, (A) $2.49, (B) 39 cts., (C) 19 cts., (D) 47 cts.; L. N. Davies, (A) $2.35, (B) 38 cts., (C) 18 cts., (D) 40 cts.; T. F. White, (A) $2.35, (B) 39 cts., (C) 18 cts., (D) 45 cts.; A. W. Beesemyer, (A) $2.21, (B) 38 cts., (C) 18 cts., (D) 50 cts.

For improving Alta St.: H. H. Curtis, (A) 34 cts. per lin. ft. for cement curb; (B) 13 cts. per sq. ft. for sidewalk; (C) 50 cts. per sq. ft. for asphalt curb.

MANUFACTURING PLANTS.

(* *Denotes that this work is advertised in Engineering News.*)

EVERETT, MASS.—The New England Trunk Co., 125 Summer St., Boston, plans to have erected a factory building on Betty St., Everett. Estimated cost, $9,000.

COHOES, N. Y.—The Fuld & Hatch Knitting Co. has completed plans which will practically double the capacity of its spinning plant. It has ordered 12 Nasmith combers and complementary silver and ribbon lay machines.

ENDICOTT, N. Y.—Endicott, Johnson & Co., shoe manufacturers, plan to erect a factory here. Plans are now being prepared.

NEW YORK, N. Y.—Young [illegible], manufacturers of hemp bags, [illegible] Long Island City, will erect a [illegible] house at their plant, to cost $[illegible]. H. Holder, Jr., Arch., 242 [illegible] Brooklyn, is taking bids for the [illegible] tory, mill construction, 60 × 150 [illegible] erected at the northwest corner [illegible] Ave. and Walworth St., to cost $[illegible]. Albert & Son, shoe manufacturers, [illegible] ington Ave., are the owners.

FREDONIA, N. Y.—The Boiler [illegible] the Fredonia Steam Heating Co., [illegible] its equipment, was completely [illegible] destroyed by the simultaneous [illegible] two boilers on Dec. 15, is to be [illegible] once.

TRENTON, N. J.—The Cook [illegible] Co. has been incorporated with a [illegible] $2,000,000, and plans to construct [illegible] here. It will manufacture linoleum [illegible] and enameled goods.

PHILADELPHIA, PA.—John Ka[illegible] ing plans prepared for a 2-story [illegible] × 106 ft., to be built at Howard [illegible] Venango Sts.

Stuckert & Sloan, Archs. and [illegible], Crozer Bldg., are receiving estimates [illegible] for alterations to the basement of the [illegible] of the Crane Ice Cream & Dairy Co., [illegible] Manning Sts.

Walter Smedley, Arch., Stephen [illegible] Girard Bldg., is preparing plans for a 7 [illegible] reinforced concrete factory building [illegible] to be built on Arch St. The plans will be [illegible] ready in about a month, when bids will be [illegible].

The Carver File Co., 3231 Frankford Ave., David Halstead, Gen. Mgr., will build a concrete and steel fireproof factory building three stories in height, in the east Spring [illegible]. The plans are being prepared by the company's engineers.

PHILADELPHIA, PA.—Revised bids are being asked for the construction of the proposed $150,000 factory building at 315-325 North Twelfth St., this city, by the Smaltz-Goodwin & Co., shoe manufacturers, Tenth and Race Sts. The plans and specifications are by the company's own architect and engineers, and the owners have rejected all previous bids. The structure will be of reinforced concrete, eight stories in height, 100 × 72 ft., and will contain complete power plant, engine and boiler rooms, steam heating system, elevators and machinery for the manufacture of shoes. All bids on the general contract and also sub-contracts will be received and tabulated by owners.

TARENTUM, PA.—Plans have been completed and contracts are to be awarded within a few weeks for the construction of a plant, which will be located on a large plot of ground on Bull Creek, back of Tarentum, and operated by the United States Engineering & Mfg. Co. The company has a Delaware charter and is capitalized at $1,000,000. The plant in its initial form will consist of a machine shop 300 ft. long by 125 ft. wide and a foundry of equal size. There will be a power house 80 ft. long by 40 ft. wide and a general office building and pattern shop. All have been grouped so that extensions can be made from time to time without interfering with the operations or well ordered grouping of the whole. In addition, the company has taken over the Bull Creek R. R. Co., which has been chartered and which will mean the construction of 4,200 ft. of railroad connecting the site in Bull Creek Valley with the Conemaugh division of the Pennsylvania R. R. This will provide not only abundant switching facilities, but it forms a key to the entrance of Bull Creek Valley and give permanency to the location for manufacturing interests. Joshua J. Jones, Westinghouse Bldg., Pittsburg, is Pres., J. M. Griffith, of Tarentum, is in charge.

BALTIMORE, MD.—Plans have been completed for the erection of a box factory for Becker Bros. & Son, at Lexington and Frederick Sts., by Theodore Wells Pietsch, Arch., American Bldg., and the contract for the work has been awarded to CHARLES L. STOCKHAUSEN, Marine Bank Bldg. It will be five stories high, of brick and stone and will cost $75,000.

BALTIMORE, MD.—The Maryland Bleaching and Dyeing Works plans to erect a plant at Hudson and Streiber Sts. It will be two stories high, of brick and concrete, 40 × 60 ft.

Stanislaus Russell, Arch., is preparing plans for a warehouse and factory to cost about $30,000. According to the tentative plans, the structure will be two stories high with a basement. It will be of brick, stone and concrete and have a frontage of 85 ft. with a depth of 125 ft. The building will be fireproof.

The Thornton Red Cross Spray Co. has been incorporated with $10,000 capital stock by Percy C. Thornton, 626 West 28th St.; Edward F. Hoffman, 419 North Fremont Ave., and Milton B. Worick, 511 East 28th St. A plant will be built to manufacture chemical compounds for disinfecting and cleaning.

The Charles J. F. Steiner Mantel Co., Charles J. F. Steiner, Pres., 124 North Lakewood Ave., has accepted plans prepared by Francis E. Tormey, 301 North Charles St., Baltimore, for the erection of a wooden mantel factory, at Monument and Eli[illegible] Sts. It will be one story, 160 × 80 ft., of brick and concrete. The bid of John K. M[illegible], 301 North Charles St., has been recommended for award.

FREDERICK, MD.—The City Hall has plans prepared by A. Mullet & Co., Union Trust Bldg., Washington, D. C., for heating plant and laundry, two stories high, of brick, 38 × 50 ft. Painter & Posey, 301 North Charles St., Baltimore, are the Eng[illegible].

POWELLVILLE (Pittsville post office), MD.—The Eastern Shore Mfg. Co. incorporated with $10,000 capital stock by [illegible] V. White, Lemuel B. Brittingham, C[illegible] Disharoon and Samuel Shockley, will erect a plant to manufacture baskets, crates [illegible] wood fruit packages.

SYKESVILLE, MD.—The Sykesville Ice & Refrigerating Co. has been organized to establish an ice plant.

WALBROOK, MD.—The Walbrook Lumber & Mfg. Co. has been incorporated with $25,000 capital stock by Stanton Fo[illegible] 2727 Maryland Ave., Frederick J. Sig[illegible], 213

North Charles St., both of Baltimore, and Charles W. Radford, of Oshkosh, Wis., to build a sash, frame door and moulding plant.

WASHINGTON, D. C.—Bids will be received by R. C. Holliday, Ch. of Bureau of Yards and Docks, Navy Dept., Washington, until 11 a. m., Jan. 28, for repairs and additions to the roof of building No. 23, at the U. S. Navy Yard, Washington. Specifications are on file at the office of Engineering News, New York.

LYNCHBURG, VA.—The plant of the Thornhill Wagon Co., recently destroyed by fire, is to be rebuilt. The capital stock, \$175,000, is to be increased, it is stated.

NORFOLK, VA.—The Virginia Veneer & Panel Co., recently organized with a capital of \$250,000, plans to acquire the property and rebuild the burned plant of the John F. Wiltz Veneer Co., at Chesterfield Heights.

PORTSMOUTH, VA.—The Portsmouth Cotton Oil Refining Corporation will receive bids about Jan. 1, for the erection of the fireproof building to replace the burned refinery. It will be of reinforcement, brick and structural steel and will cost, with machinery, \$70,000. Herman Asp Jacobi is Engr.-in-charge.

RICHMOND, VA.—The R. A. Patterson Tobacco Co., of Richmond, plans building a factory, with an annual capacity of 30,000,000 lbs. of tobacco.

ELIZABETH CITY, N. C.—The John F. Wiltz Veneer Co., of Norfolk, Va., contemplates establishing a plant here to replace its Norfolk factory, recently destroyed.

MEADOW SUMMIT, N. C.—The Fine Arts Gingham Mfg. Co., has been organized to build a mill at Meadow Summit, a new town between Spray and Draper. This plant will be equipped with 10,000 spindles and 400 looms for manufacturing fine gingham. F. C. Newlin, of Fayetteville, will be Supt.

GREENVILLE, S. C.—The Greenville Board of Trade has adopted a resolution favoring the establishment by Capt. E. A. Smith and associates, in Greenville, of a cotton mill for the manufacture of fine goods. Estimated cost, \$1,000,000.

COLUMBUS, OHIO.—The Moores & Ross Milk Co., plans to expend \$25,000 to build an addition to its plant in Ninth St. Harry C. Moores and Stanley M. Ross, are the owners.

EATON, IND.—S. J. Peek and A. P. Bolner are preparing to let a contract for the erection of a factory, to manufacture a newly patented hose reel.

EVANSVILLE, IND.—Two factories and a warehouse are to be erected by John Fendrich, it is stated, as soon as a suitable site can be selected.

TERRE HAUTE, IND.—It is reported that the Hoyne Powder Co., of Massillon, Ohio, will remove to this city and build and equip a powder factory.

WHITING, IND.—The petroleum plant of the Standard Oil Co., recently destroyed by fire, entailing a loss of \$75,000, will be rebuilt. Bids will be received as soon as plans can be completed.

MARINE CITY, MICH.—Sicken & Co., of Marine City, are contemplating rebuilding the salt plant that was recently destroyed by fire.

MUSKEGON, MICH.—The Crescent Fixture Co., of Grandville, is contemplating rebuilding its factory, recently destroyed by fire.

HASTINGS, MICH.—The Barber Chair Co., of Hastings, is having plans prepared for a 2-story factory, 130 × 122 ft. The owners will let all contracts.

DETROIT, MICH.—R. F. Monroe, of Pontiac, has let the general contract for the proposed 2-story basement laundry, 96 × 86, to be occupied by the Trojan Laundry, 11 Grand River Ave., to the SLATER CONSTRUCTION CO., of Pontiac.

DETROIT, MICH.—Smith, Hinchman & Grylls, Washington Arcade Bldg., have let the following contracts for the 1-sty foundry, 63 × 300 ft., for the Buhl Malleable Co., Charles A. Roltbone, Gen. Mgr., Wright and Adair Sts.: Structural iron work to the RUSSELL WHEEL & FOUNDRY CO.; masonry to STEFFES' SONS, 944 Dix Ave.; carpentry to HARCUS & CO., 770 Russell St., prepared roofing to HOWIE ROOFING CO., 370 Fourth Ave.; painting to VINTON CO., 120 Woodbridge St. East. Cost, \$25,000. Noted on Dec. 15.

Burrel & Gardner, Marquette Bldg., Chicago, Ill., have let the contract for the proposed brick and steel 5-story packing plant for the Hammond Standish Co., 20 Cadillac Sq., Detroit to F. H. GODDARD, Ford Bldg., Detroit. Cost \$50,000.

The Mossnick-Phipps Co., F. C. Mossnick, Secy., 1661 Champlain St., is having plans prepared for a storage shed.

Spier, Rohns & Gehrke, Chamber of Commerce Bldg., are preparing plans for a 1 and 2-story automobile factory, 50 × 200 ft., for John Beyster, 875 Fort St., West. The owner will purchase all materials and let contracts. Cost, \$20,000.

Albert Kahn and E. Wilby, Trussed Concrete Bldg., are preparing plans for a boiler house for the Chalmers Detroit Motor Car Co., R. D. Chapin, Gen. Mgr., Jefferson Ave. and New Belt Line R. R. The building is to be of reinforced concrete.

T. E. Shiels, Bamlet Bldg., has let the masonry contract for the proposed 2-story factory, 150 × 200 ft., for William Clippert, care of the Architects, to JOHN FINN & CO., McGraw Bldg. Cost, \$30,000.

DETROIT, MICH.—Albert Kahn and E. Wilby, Trussed Concrete Bldg., has let the following contracts for the proposed factory for the Kaufmann Dyeing & Cleaning Co., 1448 Woodward Ave.; masonry to W. S. POCOCK, Home Bank Bldg., carpentry to C. E. PUDRITH, 677 Medrum Ave.; composition roofing to VOIGHT & SEXANER, 148 Sherman St.; plumbing to H. SHAPERO, 253 Gratiot Ave.; plastering to M. FINN, 138 Pine St.; painting to H. J. McDONALD, 292 Brush St. It will be a 2-story and basement structure, 50 × 80 ft. Cost, \$25,000.

The same architects have let the following contracts for the proposed 1-story, factory, 220 × 50 ft., for the Bower Roller Bearing Co., of Dayton, Ohio, in Detroit: composition roofing to the HOWIE ROOFING CO., 370 Fourth Ave.; steam heating to DODSON & CO., 12 Griswold St.; plumbing to J. F. McFADDEN, 740 Holcomb Ave.; painting to the VINTON CO., 120 Woodbridge St. East.

LANSING, MICH.—It is reported that the Kerff Co., Thomas Bldg., Wall and Center Sts., Lansing are reorganizing and will build a factory on East Franklin Ave., including a machine shop and oxydizing and nickel plating plant.

LANSING, MICH.—William Saier, of Lansing, will erect an abattoir, as soon as he can secure a suitable site. The plant will contain equipment for the sanitary slaughter of stock.

PINCONNING, MICH.—The National Chicory Co., plans the erection of another factory here. Construction work will start about Feb. 1. Estimated cost, \$35,000.

MILWAUKEE, WIS.—A planing mill and factory will be erected in the spring by the Webber Mfg. Co. Property for the plant has been purchased on National Ave., near the Chicago & North-Western tracks.

LAKEWOOD, N. MEX.—The Lakewood Truck Growers Association has been incorporated and will at once erect a concrete canning factory.

CLARKSTON, WASH.—Plans have been completed for the erection of a box making plant for the Valley Lumber Co. The company also plans to overhaul the sawmill and add new machinery.

SPOKANE, WASH.—Preparations are being made for the establishment of a factory in Spokane to make the Johnson automatic switch. Work on the \$25,000 plant will start early in the spring. At a recent meeting of stockholders of the Johnson Automatic Switch Co., the capital stock was increased from \$25,000 to \$100,000, and definite action for the building of two manufacturing plants one in Spokane, and one at some eastern distributing point, yet to be determined. E. E. Johnson, inventor of the patent, is Pres.

TORONTO, ONT.—The Imperial Flour Mill Co., will erect a flour mill on the site of the Alexander Brown Milling Co., on the Esplanade. The mill will have a capacity of 3,000 bbls. per day, and a 1,000,000 bu. elevator will also be erected. Alexander Brown and A. Emilius Jarvis are interested.

MISCELLANEOUS CONTRACTS.

*(*Denotes that this work is advertised in Engineering News.)*

U. S. RECLAMATION SERVICE.—All news concerning canal and irrigation projects, etc., will be found under Water Supply—Irrigation.

SUBWAY, TUNNEL.—Boston, Mass.—Plans have been prepared by the New York, New Haven & Hartford R. R. Co., C. S. Mellen, Pres., showing the removal of North Station to East Cambridge, with a subway to connect North with South Station, and a proposed boulevard over the subway, also a tunnel under the harbor from the new station to the old North station.

HARBOR IMPROVEMENT.—Marblehead, Mass.—Plans have been submitted to the Park Commission. It is reported, by promoters of a new hotel, for the improvement of Marblehead Harbor. The plans provide for a sea wall to be built from Proctor Park across to the Marblehead Neck end of the causeway. The harbor is to be dredged and the material taken from it dumped between the park and the sea wall making considerable new land. On this land it is proposed to build a hotel costing about \$500,000. A park larger than Proctor Park will be laid out and a public landing constructed.

*DREDGING.—Newport, R. I.—Bids will be received until 2 p. m., Jan. 13, by Lt. Col. J. C. Sanford, Corps Engrs., U. S. A., for dredging Newport Harbor.

*DREDGING.—Stamford, Conn.—Bids will be received by Lt.-Col. Harry Taylor, Corps Engrs., U. S. A., New London, Conn., until 3 p. m., Jan. 21, for dredging in Stamford Harbor.

*DREDGING.—New Haven, Conn.—Bids were received by Lt.-Col. Harry Taylor, Corps Engrs., U. S. A., New London, Conn., on Dec. 21, for dredging about 405,000 cu. yds. in New Haven Harbor as follows: P. Sanford Ross, Inc., Jersey City, N. J., 7 8/10 cts. per cu. yd.; Coastwise Dredging Co., 9 95/100 cts.; Morris & Cumings Dredging Co., 12 9/10 cts.; Taylor Dredging Co., 7 60/100 cts.; William Beard & Co., 13 4/10 cts.

ELEVATOR WORK.—New York, N. Y.—Bids were received as follows on Dec. 20 by George McAneny, Pres. Boro. Manhattan, for furnishing all labor and materials required for the erection and installation of an elevator shaft and elevator in the rear of the building located at 264 Madison St., Boro. Manhattan: Henry E. Fox, 41 Park Row, New York, \$7,300; Excelsior Repairing & Supply Co., \$8,765; Otis Elevator Co., \$8,567; National Elevator Co., \$8,185; Concord Construction Co., \$9,673.

EMBANKMENT WALLS.—New York, N. Y.—Bids were received as follows on Dec. 22 by the Department of Correction for preparing for and building a rip-rap embankment and walls to close the gap in the existing wall and raising the grade of the existing wall at Rikers Island, Boro. The Bronx: O'BRIEN BROS., Inc., 54 South St., New York, 73 cts. per cu. yd. (awarded contract); Bouker Contracting Co., 88 cts.

REPAIRS TO PIER.—New York, N. Y.—Bids were received as follows on Dec. 20 by Calvin Tompkins, Comr. of Docks, for (a) furnishing all the labor and materials required for making repairs to pier at East 100th St., Harlem River, Boro. Manhattan; (b) for furnishing all the labor and materials required for repairing the pier at the foot of West 80th St., North River, Boro. Manhattan: J. Bart Cronin, (a) \$10,300, (b) \$13,400; H. R. Asserson, (a) \$11,089; Riverside Contracting Co., (a) \$10,867, (b) \$12,618; Phoenix Construction Co., (a) \$10,197, (b) \$15,697; Butler Bros. Construction Co., (a) \$14,262, (b) \$16,235; G. B. Spearin, (a) \$12,492, (b) \$16,475; Godwin Construction Co., (b) \$13,600; Wm. P. McDonald, (b) \$13,777.

COMFORT STATION.—New York, N. Y.—Bids were received as follows on Dec. 20 by George McAneny, Pres. Boro. Manhattan, for furnishing all the labor and materials required for the construction and installation of a public comfort station in the building known as Washington Market, situated at Fulton and West Sts., Boro. Manhattan: Merrick Fireproofing Co., \$8,100; F. J. Fee, \$10,982; James I. Valentine, \$8,674; A. & W. Gray Co., \$10,838; Concord Construction Co., \$10,787; Chris. Nally, \$11,415; J. J. Kenny Co., \$9,283; J. M. Knapp, 544 West 43d St., \$8,922.

ENGINES.—New York, N. Y.—Bids were received as follows on Dec. 20 by R. Waldo, Fire Comr., for furnishing and delivering two gasoline propelled and pumping engines: Webb Fire Apparatus, 50 West Broadway, New York, \$16,500; Watrous Fire Engine Co., \$17,000.

*DREDGING, ROCK REMOVAL.—New York, N. Y.—Bids have been received as follows by Col. W. M. Black, Corps Engrs., U. S. A., for (a) dredging and (b) rock removal on the Hudson River, N. Y.: P. Sanford Ross, Jersey City, N. J., (a) \$4.23 per cu. yd., (b) 35 cts. per cu. yd.; American Paving & Construction Co., Philadelphia, Pa., (a) \$7.80, (b) 30 cts.; M. J. Dady, Brooklyn, (a) \$4.35, (b) 33 cts.; Coastwise Dredging Co., Norfolk, Va., (a) \$3.95, (b) 23.9 cts.

DREDGING.—New York, N. Y.—Bids were received on Dec. 22 by Alfred E. Steers, Pres. Boro. Brooklyn, for dredging Gowanus Canal, from head to Station No. 31: R. G. PACKARD CO., 130 Pearl St., New York, 47 cts. (awarded contract); United States Dredging & Contracting Co., 49 cts.

MOTOR LAWN MOWER, ETC.—New York, N. Y.—Bids will be received by the Park Board, Department of Parks, until 3 p. m., Jan. 5, for furnishing and delivering one motor lawn-mower, and repairing and keeping in repair motor, horse and hand lawn mowers, for parks, Boro. The Bronx. Charles B. Stover is Pres. Bd.

DREDGING.—New York, N. Y.—Bids were received as follows on Dec. 22 by the Bureau of Yards and Docks, Navy Dept., Washington, D. C., for dredging at outboard end of launching ways, navy yard, New York: P. Sanford Ross, Inc., 277 Washington St., Jersey City, N. J., \$12,900; R. G. Packard Co., 130 Pearl St., New York, \$14,450.

FIRE PROTECTION.—New York, N. Y.—Bids will be received by C. B. J. Snyder Supt. of School Bldgs., dept. of Education until 3.30 p. m., Jan. 9, for fire protection works, etc., at Public School 13, 216th St. and Willett Ave., Williamsbridge, Boro. The Bronx.

ROAD ROLLER.—New York, N. Y.—Bids were received by George Cromwell, Pres. Boro., of Richmond, on Dec. 23, for furnishing all the labor and materials required for one 15-gross-ton steam roller, with equipment. The contract has been awarded to the BUFFALO STEAM ROLLER CO., 150 Nassau St., New York.

REPAIRS TO PIER.—New York, N. Y.—Bids have been received as follows by Calvin Tompkins, Comrs. of Docks, for contract No. 1290 for furnishing all labor and materials required for making repairs to pier at East Fifth St., East River, Boro. of Manhattan: Godwin Construction Co., \$16,254; J. Barth Cronin, \$13,800; Phoenix Construction Co., 11 Park Row, New York, \$13,197; William P. McDonald, \$14,385.

BARGE CANAL.—Albany, N. Y.—Contracts for Barge Canal work have been awarded as follows by F. C. Stevens, Supt. Pub. Wks., Albany: Contract 48, Erie Canal, Section 8, for construction of a canal from a point near the New York Central R. R. crossing at Lyons, to a point near the West Shore R. R. crossing at East Newark, length, 5.75 miles, to the CROWELL-SHERMAN-STALTER CO., Cleveland, Ohio, at \$1,701,671; engineer's estimate, \$1,626,450.

Contract 51, Erie Canal, Section 5, for constructing a canal feeder between Trenton Falls and Nine-Mile Creek, together with gate-house, culverts and all other work, length 5.75 miles, GEO. T. CUNNINGHAM, Utica, \$389,842; engineer's estimate, \$424,710.

Contract 76, Erie Canal, Section 8, for constructing the canal from a point near the West Shore R. R. crossing at East Newark, to a point about one-half mile east of Port Gibson, length, 5.77 miles, T. A. GILLESPIE CO., New York, \$1,494,057; engineer's estimate, \$1,504,776.

Contract 77, Erie Canal, Section 8, for constructing the canal from a point about one-half mile east of Port Gibson, to about one-half mile west of Palmyra, length, 6.78 miles, T. A. GILLESPIE, New York, \$1,652,148; engineer's estimate, \$1,790,672.

Contract 80, Oswego Canal, Section 1, for constructing a dam and bulkheads across the Oswego River at Phoenix, N. Y., WALTER BRADLEY, Fulton, \$117,390; engineer's estimate, \$134,340. List of bidders noted on Dec. 22.

Bids were received by F. C. Stevens, Supt. Pub. Wks., on Dec. 21, on Barge Canal contracts as follows:

Contract No. 91, Erie Canal, Section 1, for building and equipping hydro-electric power plant on the Erie Canal near the east end of Crescent Dam. Contract A, Cayuga and Seneca Canal, Section 1, for constructing Lock No. 1 and Dam No. 1 near Cayuga; length, .25 mile. Contract B, Cayuga and Seneca Canal, Section 1, for excavating a channel mainly in the Seneca River from Montezuma to deep water in Cayuga Lake, from Cayuga Lake to Seneca Falls and from Waterloo to deep water in Seneca Lake; length, 17.2 miles. The bids were: Contract No. 91, Erie Canal: Engineer's estimate, \$44,600; John W. Flynn, Waterford, N. Y., \$43,595; D'Oller Engineering Co., Philadelphia, Pa., \$51,898; Brown & Lowe, Schenectady, N. Y., \$54,629; WELLS, BOUGHTON CO., Troy, N. Y., \$42,940 (awarded contract). Contract A, Cayuga and Seneca: Engineer's estimate, \$393,133; Mac Arthur Bros. Co., New York, \$364,396; Coast & Interior Contracting Co., Fayetteville, N. Y., \$399,224; W. J. Burns Co., Syracuse, N. Y., \$387,278; Great Lakes Construction Co., Buffalo, N. Y., \$397,778; SCOTT BROS., Rome, N. Y., \$357,627 (awarded contract); Larkin & Sangster, Lockport, N. Y., \$421,653; Sundstrom & Stratton, 90 West St., New York, \$400,139; H. P. Burgard Co., Buffalo, N. Y., \$380,528. Contract B, Cayuga and Seneca Canal: Engineer's estimate, \$1,832,550; Maryland Dredging & Contracting Co., Baltimore, Md., \$1,576,550; S. Pearson & Son, Inc., 507 Fifth Ave., New York, \$1,678,162; American Pipe & Construction Co., 112 North Broad St., Philadelphia, \$1,555,640; Grant, Smith & Co., and Locker, Grosse Isle, Mich., \$1,688,556; CROWELL-SHERMAN-STALTER CO., Cleveland, Ohio, \$1,448,550 (awarded contract). Contracts A and B are the first contracts for the Cayuga and Seneca Canal improvement to be advertised.

ELIMINATION OF GRADE CROSSINGS.—Jamestown, N. Y.—The New York State Public Service Commission has prepared plans for elevated track structure, elimination of grade crossings of the Erie R. R. in this city and submitted them to the Common Council on Dec. 24, with estimate of cost of the work which amounts to \$560,000, cost to be borne one-half by the Erie R. R. and the remainder by the city and state. Definite action will be taken soon.

BOARD WALK.—Brooklyn, N. Y.—The sum of \$80,000 has been subscribed for the construction of a board walk for the Belle Harbor Property Owners' Association. It is planned to construct a board walk 4,000 ft. long and 40 ft. wide. John C. Judge is Secy., 44 Court St., Brooklyn.

PIER.—Long Branch, N. J.—The Ocean Construction Co., Long Branch, has been organized to take over the property of the Long Branch pier, and to take steps toward completing the partly constructed pier before the opening of the season of 1911. The incorporators are: W. D. Hayward, Jacob Meyers and William Lindsay. Work on the new pier was suspended on Dec. 1, with 97 piling driven and more than 300 ft. of the 850 ft. of the piling in position. As soon as weather permits the concrete flooring will be laid on the 300 ft. already constructed.

PIER.—Jersey City, N. J.—The general contract for the erection of an open pier for the Central Railroad Co. of New Jersey at Communipaw has been awarded to the BUTLER BROS. CONSTRUCTION CO., 1170 Broadway, New York. It will be 65 ft. wide and 845 ft. in length with two anchor cribs each 25 × 60 ft. The cost of the structure will be about \$40,000.

PARKS AND PLAYGROUNDS.—Atlantic City, N. J.—The Mayor has signed the bill authorizing a bond issue for \$242,000 for the purchase of property at the inlet for parks and playgrounds.

DREDGING.—Wilmington, Del.—The AMERICAN DREDGING CO., Philadelphia, Pa., has been awarded the contract for dredging the harbor at Wilmington, Del., by the U. S. Government. Bids were opened on Dec. 10. List of bidders noted on Dec. 22.

JETTY WORK.—Wilmington, Del.—Bids for jetty work at the mouth of Broadkill River, Del., were received as follows by Maj. R. R. Raymond, Corps Engrs., U. S. A., Wilmington, on Dec. 23: (a) reinforced jetty; (b) construction of dike; (c) stone filling per 2,000 lbs., in place: Tatnall Brown Co., (a) \$10.25; (b) \$6; (c) \$4. Latta & Terry Construction Co., (a) \$12.80; (b) \$6; (c) \$5. Peninsula Cut Stone Co., (a) \$8.99; (b) \$6.25; (c) \$3.15.

REPAIRS TO NAVAL VESSELS.—Washington, D. C.—Repairs to naval vessels aggregating \$1,190,000 are provided for in estimates submitted to Congress for use in the next fiscal year. The Secretary of the Navy asked for authority to spend from the appropriate funds \$500,000 each on the "Georgia" and "Virginia," for modernizing their turrets, \$120,000 on the "Arethusa," \$25,000 on the "Iroquois," and \$45,000 on the "Nero."

DAMS.—Washington, D. C.—The House of Representatives on Dec. 19 passed bills authorizing the construction by the Great Northern Development Co. of a dam across the Mississippi River at Coon Rapids and the construction by the city of Sturgis, Mich., of a dam across the St. Joseph River.

DRILLING MACHINES, STEEL FORGINGS, ETC.—Washington, D. C.—Bids will be received by the Bureau of Supplies and Accounts, Navy Dept., Washington, D. C., until Jan. 3, for furnishing at various naval stations and navy yards the following supplies: Washington, D. C., Schedule 3190 two drilling machines; Schedule 3195, 18,230 lbs. steel tubes; Schedule 3194, 51 M. ft. white oak; Schedule 3195, 62,700 lbs. nickel steel forgings; Boston, Mass., Schedule 3201, 4,300 lb. w. i. or steel pipe; Schedule 3197, 53 reams of emery cloth; 5,360 lbs. steel nuts and bolts; Schedule 3196, 31,000 ft. whtie pine, 40,000 ft. yellow pine, 14,000 ft. white spruce; Schedule 3201, 2,800 lbs. round naval brass, 600 lbs. sheet brass, 3,128 lbs. sheet copper; Schedule 3200, 30,000 lbs. angle medium steel and 7,800 lbs. galvanized sheet steel; Norfolk, Va., Schedule 3197, 41,000 lbs. hull steel rivets; Schedule 3200, 148,600 lbs. steel shapes; Newport, R. I., Schedule 3194, 11,000 ft. white pine; Philadelphia, Pa., Schedule 3196, 15,000 ft. yellow pine; Portsmouth, N. H., Schedule 3201, 6,000 lbs. manganese ingot bronze.

CAISSONS.—Washington, D. C.—Bids were received as follows on Dec. 22, by the Bureau of Yards and Docks, Navy Dept., Washington, for furnishing caissons for the dry-docks at New York, Pearl Harbor, H. T., and Puget Sound, Wash., under the following items: Item 1, caissons for dry-dock No. 4, New York, No. 1, Pearl Harbor, and No. 2, Pugent Sound; Item 2, caissons for Pearl Harbor and Puget Sound; Item 3, caisson for Pearl Harbor only; Item 4, caisson for Puget Sound only; Item 5, caisson for New York only: Snare & Triest Co., 143 Liberty St., New York, (5) \$122,980; Union

Iron Works Co., 320 Market St., San Francisco, Cal., (2) $276,370; (3) $134,675; (4) $141,695; James Shewan Sons, Houston St. and East River, New York, (5) $132,000; John N. Robins Co., 15 Whitehall St., New York, (5) $142,300; Williamette Iron & Steel Works, Portland, Ore., (4) $148,000; Moran Co., Seattle, Wash., (4) $125,000; (3) $110,000, delivered afloat in Seattle Harbor.

*LEAVES FOR WEIRS.—Wheeling, W. Va.—Bids were received as follows by Capt. F. W. Altstaetter, Corps Engrs., U. S. A., on Dec. 19, for furnishing and erecting leaves for two bear trap weirs of Dam 26, Ohio River; 621,430 lbs. of structural steel: (a) per lb.; (b) total: The Pennsylvania Steel Co., Philadelphia, Pa., 4.73 cts., (b) $29,394; W. N. Kratzer & Co., Pittsburg, Pa., 4.53 cts., (b) $28,151; Independent Bridge Co., Pittsburg, Pa., 5.24 cts., (b) $32,562; Penn Bridge Co., Beaver Falls, Pa., 5.24 cts., (b) $32,563.

*LOCK GATES, ETC.—Wheeling, W. Va.—Bids were received on Dec. 22, by Capt. M. C. Tyler, Corps Engrs., U. S. A., Wheeling, as follows, for furnishing and erecting steel lock gates and furnishing and delivering Poiree-dam trestles, gate recess covers and tank-pit covers for Dam 26, Ohio River: (a) structural steel, Lot A; (b) oak timber; (c) structural steel, Lot B: The Pennsylvania Steel Co., Philadelphia, Pa., (a)- 5.73 cts., (b) $65 per M ft. (c) 3.33 cts.; Independent Bridge Co., Pittsburg, Pa., (a) 5.41 cts. (b) $75. (c) 3.45 cts.; Penn Bridge Co., Beaver Falls, Pa., (a) 5.95 cts. (b) $70. (c) 3.18 cts.; W. N. Kratzer & Co., Pittszurg, Pa., (a) 5.73 cts. (b) $98. (c) 3.13 cts.; American Bridge Co., Pittsburg, Pa., (c) 29 cts.

*BANK PROTECTION.—Savannah, Ga.—Bids will be received until noon, Jan. 26, by Col. Dan C. Kingman, Corps Engrs., U. S. A., Savannah, for bank protection of Savannah River at Augusta, Ga.

QUAY WALL.—Key West, Fla.—Bids were received as follows on Dec. 22, by the Bureau of Yards and Docks, Navy Dept., Washington, for the construction of a quay wall structure at the Naval Station, Key West: Grant Wilkins, 23½ Whitehall St., Atlanta, Ga., $88,300; MacArthur Concrete Pile & Foundation Co., 11 Pine St., New York, $125,000; Penn Bridge Co., Bond Bldg., Washington, $154,700.

*SAND AND GRAVEL.—Montgomery, Ala.—Bids were received as follows on Dec. 21 by Maj. J. B. Cavanaugh, Corps Engrs.; U. S. A., Montgomery, for sand and gravel: (a) sand, per cu. yd.; (b) gravel, per cu. yd.: Brewer & Jones, Birmingham, (a) 65 cts. (b) 85 cts.; T. E. Grafton, Rome, Ga., (a) 75 cts. (b) 90 cts.

*STEEL BARGES.—New Orleans, La.—Bids will be received until 11 a. m., Jan. 26, by Maj. H. Burgess, Corps Engrs., U. S. A., for constructing and delivering two steel barges.

DRAINAGE DITCH.—Lake Arthur, La.—Bids for the construction of a drainage ditch in Thornwell Drainage District No. 1 will be received by E. E. Baker, Secy., Lake Arthur, La., Bd. Comrs. of said district, until Jan. 10.

IRON FENCES AND GATES.—Cleveland, Ohio.—Bids will be received by the Department of Public Service, until noon, Jan. 4, for iron fences and gates. A. B. Lea is Dir.

DITCH.—Wheatfield, Ind.—Bids will be received until Dec. 30 by W. Frank Osborne, County Surv., Rensselaer, Ind., for constructing the R. E. Davis ditch at Wheatfield. Estimated cost, $24,000.

MONUMENT.—La Fayette, Ind.—The local lodges of the Knights of Pythias and the County Commissioners are preparing to erect a monument to General James R. Carnehan in the courthouse grounds. Estimated cost, $50,000.

GRAIN ELEVATOR.—Terre Haute, Ind.—The Hudnut Co. recently incorporated with a capital of $100,000, will soon ask for bids for the construction of a large grain elevator. B. J. Hudnut is Pres.

*PIER WORK.—Detroit, Mich.—Bids were received as follows on Dec. 22, by Col. C. McD. Townsend, Corps Engrs., U. S. A., Detroit, for removal of old superstructure and building concrete superstructure on north pier and on pier-head of south pier at harbor of refuge, Harbor Beach, Mich.: (a) removing old superstructure, 1,455 lin. ft.; (b) concrete sections in place, 8,780 cu. yds.; (c) 10,000 bbls. cement; (d) mooring posts, 17; (e) oak fenders per M ft. B. M., 4,650 ft. B. M.; (f) total: Burk, Smith & Nelson, Muskegon, Mich., (a) $5, (b) $6, (c) $1.25, (d) $25, (e) $75, (f) $73,304; The Henahan-King Co., Cleveland, Ohio, (a) $5, (b) $6, (c) $1.40, (d) $100, (e) $80, (f) $76,117; Hugo & Tims Co., Duluth, Mich., (a) $9, (b) $5.75, (c) $1.50, (d) $35, (e) $90, (f) $79,653; John Ginzel, Detroit, Mich., (a) $10, (b) $5.75, (c) $1.50, (d) $35, (e) $70, (f) $81,005; Aquila G. Osman, Duluth, Mich., (a) $7, (b) $6.50, (c) $1.70, (d) $19, (e) $70, (f) $86,304; The Hunkin-Conkey Construction Co., Cleveland, Ohio, (a) $10, (b) $6.83, (c) $1.22, (d) $70, (e) $70, (f) $88,250; Gleiling Bros. Co., Green Bay, Wis., (a) $7, (b) $7.25, (c) $1.40, (d) $35, (e) $65, (f) $88,807.

LIFE SAVING STATION.—Eagle Harbor, Mich.—Bids will be received by the Life-Saving Service, Treasury Dept., Washington, D. C., until 2 p. m., Jan. 27, for the construction of a life saving station at Eagle Harbor. Specifications, etc., can be obtained upon application to the Assistant Inspector of the Eleventh Life-saving District, Room 204, Post Office Bldg., Detroit, Mich.; the superintendents of construction of life saving stations, 379 Washington St., New York, or at the office of S. I. Kimball, Gen. Supt., Washington.

REBUILDING SMOKE STACK.—St. Charles, Ill.—Bids will be received until Jan. 3 by the Board of Administration, Springfield, for rebuilding the steel smoke stack at St. Charles School for boys here. Address Frank D. Whipp, Fiscal Superv., Springfield.

CEMENT.—Chicago, Ill.—Bids will be received until Dec. 30, by B. J. Mullaney, Comr. Pub. Wks., for furnishing and delivering 2,000 bbls of natural cement and 100 bbls. of Portland cement, as required during a period ending Dec. 31, 1911.

WAGON.—Rock Island, Ill.—Bids will be received by the Commanding Officer, Rock Island Arsenal, Rock Island, until 2 p. m., Jan. 11, for furnishing and delivering at the Rock Island Arsenal, one standard 1-ton delivery wagon, with open top, screen express body, equipped with 60-cell A-6 Edison battery, to be equal to the 1,000 lb. wagon manufactured by the Landden Co., of Newark, N. J.

DITCH.—Roseau, Minn.—Bids were opened on Dec. 8 for constructing judicial ditch No. 10, about 797,381 yds. excavation. The contract has been awarded to the J. B. ARPIN DREDGING CO., Grand Rapids, Wis. Estimated cost, about $81,291.

DREDGING, FILLING.—Minneapolis, Minn.—Bids for dredging in Lake Calhoun and for filling low lands and boulevard adjacent, will be received by the Board of Park Commissioners, City Hall, Minneapolis, until noon, Jan. 21. A form of contract containing specifications, with a map and plan attached, is on file in the office of the Board, and copies will be furnished on application. The estimated amount of material to be moved is 500,000 cu. yds. J. A. Ridgway is Secy. Bd.

PAVING BLOCKS, CEMENT, ETC.—Minneapolis, Minn.—Bids will be received by the city until Jan. 13, for sandstone paving blocks, 40,000 sq. yds; creosoted wood paving blocks, 175,000 sq. yds.; brick, 20,000 sq. yds.; crushed granite, 5,000 cu. yds.; granite curb, 5,000 lin. ft.; sandstone curb, 5,000 lin. ft.; Portland cement, 60,000 bbls., the above to be used for paving work; also for Portland cement, 15,000 bbls., for sewer work; and Portland cement, 30,000 bbls., for water-works and filtration plant.

ICE PLANT.—Cuero, Tex.—The Northern Produce Co. will install an ice plant here.

DITCH.—Chandler, Okla.—Bids were received on Dec. 16 by C. A. Wightman, Engr. and Surv., Deep Fork Drainage District No. 1, Lincoln County, at the office of J. E. Rea, County Clk., Chandler, for the construction of a ditch for the district. The contract was awarded to CONKLIN, ROONEY, JOHNSON & HOFFMAN, Chandler, the only bidders, at 10 cts. per yd. It is estimated that the work will require 7,000,000 yds. of earth excavation. Payment will be made in bonds.

DREDGING.—Seattle, Wash.—Bids were received as follows on Dec. 14 by Maj. C. W. Kutz, Corps Engrs., U. S. A., for dredging Willapa River and Harbor, Wash: Standard American Dredging Co., 26 cts. per cu. yd.; Puget Sound Bridge & Dredging Co., 19 9-10 cts.; International Dredging Co., 26 3-10 cts.; Tacoma Dredging Co., 23½ cts.

TUNNEL.—Carbondale, Cal.—JOHN PETERSON has been awarded the contract for constructing the tunnel through Red Point hill above here, which will be used in place of the flume which runs around the ridge of the hill. The tunnel will be between 700 and 1,000 ft. long.

STEEL STEAMER.—Dartmouth, N. S.—The contract for the construction of steel steamer has been awarded to MACKIE & BAXTER, at $60,250.

DREDGE.—Ottawa, Ont.—Bids will be received by R. C. Desrochers, Secy. Dept. Pub. Wks., Ottawa, until 4 p. m., Jan. 11, for the construction of a 15-in. suction dredge.

Plans, specifications and form of contract can be seen and forms of proposal obtained at the Department of Public Works, Ottawa, at the office of J. L. Michaud, District Engr., Merchants Bank Bldg., St. James St., Montreal; J. G. Sing, Esq., District Engr., Confederation Life Bldg., Toronto, Ont., and G. G. Scovil, Supt. of Dredges, St. John, N. B.

WHARF, STONE APPROACH.—Ottawa, Ont.—Bids will be received by R. C. Desrochers, Secy. Dept. Pub. Wks., Ottawa, until 4 p. m., Jan. 16, for the construction of a wharf and stone approach at Gravenhurst, Township of Muskoka. Plans, specifications and form of contract can be seen and forms of proposal obtained at the Department of Public Works, Ottawa, at the offices of H. J. Lamb, District Engr., London, Ont.; J. G. Sing, District Engr., Confederation Life Bldg. Toronto, Ont., and on application to the Postmaster at Gravenhurst, Ont.

STEEL STEAMERS.—Ottawa, Ont.—The Dominion Government on Dec. 21, awarded the contract for a new steel steamer for lighthouse and buoy service on the Pacific Coast, to the COLLINGWOOD SHIPBUILDING CO., at $260,000.

STEEL STEAMER.—Ottawa, Ont.—Bids will be received by the Department of Marine and Fisheries, Alex. Johnston, Deputy Minister, Ottawa, until Feb. 15, for the construction of a twin-screw steel steamer for survey and inspection work on the St. Lawrence River ship channel, to be delivered at Quebec, with following dimensions: Length between perpendiculars, 130 ft.; breadth moulded, 27 ft.; depth moulded, 13 ft. 6 ins.; draft, mean, 9 ft. 6 ins. Plans and specifications at Marine Department, Ottawa, or agencies at Montreal, St. John, N. B., Halifax, N. S., or Victoria, B. C.

ROCK CRUSHER.—North Vancouver, B. C.—Bids will be received until Jan. 2 by George S. Hanes, City Engr., for supplying a portable steel frame jaw rock crusher, with jaw opening 11 × 18 ins., and a capacity of 20 tons per hour.

For other Proposal Advertisements see pages 51, 52, 53, 54, 55 of Advertisements and Construction News page 316.

U. S. ENGINEER OFFICE, Savannah, Ga., December 27, 1910.—Sealed proposals for bank protection of Savannah River at Augusta, Ga., will be received at this office until 12 noon (Eastern Standard Time), January 26, 1911, and then publicly opened. Information upon application. DAN C. KINGMAN, Colonel, Engineers.

NOTICE TO DREDGING CONTRACTORS.

Office of Board of Park Commissioners,
City Hall, Minneapolis, Minnesota,
December 21, 1910.

Sealed proposals for dredging in Lake Calhoun and for filling low lands and boulevard adjacent, will be received by the Board of Park Commissioners, at their office at the City Hall, Minneapolis, Minnesota, until twelve o'clock M., of the 21st day of January, 1911.

A form of contract containing specifications, with a map and plan attached, is on file in the office of the Board, and copies will be furnished on application.

The estimated amount of material to be moved is 500,000 cubic yards.

Each bid must be accompanied by a certified check, in at least the sum of $1,000.00, payable to the order of C. A. Bloemquist, City Treasurer, to be forfeited if the bidder, being awarded the contract, shall fail to enter into the contract and furnish the bond required by Section 4535, Revised Laws 1905.

The Board of Park Commissioners reserves the right to reject any and all bids.

J. A. RIDGWAY,
Secretary.

SEWER SYSTEM.

Syracuse, N. Y.

Sealed proposals for Contract No. 10 for the improvement of Harbor Brook and the construction of the Harbor Brook intercepting sewer system will be received until 10 o'clock A. M., January 26, 1911, at the offices of the Syracuse Intercepting Sewer Board, No. 317 City Hall, Syracuse, N. Y. The work embraces approximately 2 miles of brook improvement and 2½ miles of intercepting sewer ranging in diameter from 50 to 25 inches, and is divided into two divisions of about equal lengths. Proposals may be made for either or both Divisions. The intercepting sewer is to be constructed of concrete and much of it will require a pile foundation. Harbor Brook will be deepened and lined with concrete. Proposals must be made on blanks to be furnished upon application, and must be accompanied by a New York draft or certified check upon a Syracuse Bank in the sum of $5,000.00 for each Division for which a bid is submitted. Drawings, specifications and form of proposal and contract are on file in the offices of the Board. Copies may be obtained by depositing Ten Dollars to insure their return in acceptable condition before March 1, 1911.

HARRY J. HAMLIN,
Secretary.

SEWER.

OFFICE OF THE COMMISSIONERS OF SEWERAGE OF LOUISVILLE, KY.
Incorporated.

Sealed proposals for the construction of a sewer known as the "Second Street Sewer," Contract No. 77, of the Comprehensive System of Sewerage for the City of Louisville, Ky., will be received at the office of the Commissioners of Sewerage, 605 Equitable Building, Louisville, Ky., until 12 o'clock noon, January 20, 1911.

The work will consist of the construction of about 2,430 ft. of 42" and 48" concrete sewer, including about 850 cu. yds. of concrete. Excavation 10 ft. to 22 ft. deep.

Plans and specifications may be seen at the office of the Commissioners and at the office of Harrison P. Eddy, Consulting Engineer, 14 Beacon St., Boston, Mass.

Sealed bids should be endorsed "Proposals for Second Street Sewer," and addressed to the Commissioners of Sewerage, Equitable Building, Louisville, Ky. Each bid must be accompanied by a certified check for at least seven per cent. (7%) of the total amount of the bid, or a "Bidder's Bond" as described in the form of proposal.

P. L. ATHERTON,
Chairman.
CHAS. P. WEAVER, Secy. & Treas.
J. B. F. BREED, Chief Engineer.

U. S. ENGINEER OFFICE, 3338 St. Charles Avenue, New Orleans, La., Dec. 26, 1910.—Sealed proposals for constructing and delivering Two Steel Barges will be received at this office until 11 o'clock A. M., January 26, 1911, and then publicly opened. Information on application. H. BURGESS, Major, Engineers.

GRAVEL ROAD.

County of Bur... N. J.

Proposals for graveling ... Gardner's Corner through ... road from ... to the Atlantic County line, in ... County of Burlington.

Sealed proposals for furn... all material and labor necessary ... graveling above road will be receive... the Director of the Board of Fr... Road Committee and County ... Engineer at the County Collector's offi... Mt. Holly, Burlington Co., N. J., at 11 ... Thursday, Jan. 19th, 1911, and ... read immediately thereafter.

Plans and specifications m... be seen at the office of the State Co... Engineer of Public Roads, Trenton, N. ... or at the office of Earl Thomson, Co... Engineer, 301 Market St., Camden, N.

All bids must be accompa... by a certified check in the sum ... $1,000.00 drawn to the order of Har... E. Dubell, Director, to insure the su... ful bidder entering into the contract.

The Committee reserves ... right to reject any or all bids.

By order of the Board of ... sen Free-holders of the County of Bur... ton, N. J.

HARRY E. DABELL,
Director
GEORGE A. M... OY,
TURNER BIRKHEAD,
WILLIAM MILLE...
Committee.
EARL THOMSON, County Engineer
ERNEST D. HOLEMAN, Clerk.

PROPOSALS TO FURNISH MACHINES Motors, and Limit Switches to operate t... Stoney Gate Valves and Cylindrical Valves for Controlling the Culverts of the Locks at Gatun, Pedro Miguel and Miraflores.—Sealed proposals will be received at the office of the General Purchasing Officer, Isthmian Canal Commission, Washington, D. C., until 10.30 a. m., February 25, 1911, at which time they will be opened in public, for furnishing the above-mentioned articles. Blanks and general information relating to this Circular (No. 614) may be obtained from this office or the offices of the Assistant Purchasing Agents, 24 State Street, New York City; 55 National Realty Building, New Orleans, La., and 1086 North Point Street, San Francisco, Cal.; also from the U. S. Engineer Offices in the following cities: Seattle, Wash.; Los Angeles, Cal.; Baltimore, Md.; Philadelphia, Pa.; Pittsburg, Pa.; Boston, Mass.; Buffalo, N. Y.; Cleveland, Ohio; Cincinnati, Ohio; Chicago, Ill.; St. Louis, Mo.; Detroit, Mich.; Milwaukee, Wis.; St. Paul, Minn.; Chattanooga, Tenn.; Louisville, Ky.; Mobile, Ala., and Galveston, Tex.; Commercial Club, Kansas City, Mo.; Chamber of Commerce, Quincy, Ill., and Chamber of Commerce and Board of Trade, Tacoma, Wash. F. C. BOGGS, Captain, Corps of Engineers, U. S. A., General Purchasing Officer.

TREASURY DEPARTMENT, Office of the Supervising Architect, Washington, D. C., December 17, 1910.—Sealed proposals will be received at this office until 3 o'clock p. m., on the 21st day of January, 1911, and then opened, for the construction (including plumbing, gas piping, heating apparatus, electric conduits and wiring) of the United States post-office and court-house at Bowling Green, Kentucky, in accordance with the drawings and specification, copies of which may be had from the custodian of site at Bowling Green, Ky., or at this office, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect.

U. S. ENGINEER OFFICE, New London, Conn., Dec. 21, 1910.—Sealed proposals for dredging in Stamford Harbor, Conn., will be received here until 2 p. m., Jan. 21, 1911, and then publicly opened. Information on application. HARRY TAYLOR, Lt. Col., Engineers.

U. S. ENGINEER OFFICE, Newport, R. I., Dec. 29, 1910. Sealed proposals for dredging Newport Harbor, R. I., will be received here until 2 P. M., Jan. 13, 1911, and then publicly opened. Information furnished on application. J. C. SANFORD, Lt. Col., Engrs.

Situations Open

APPLICATIONS to "C. A. ..." regarding positions surveying corps ... Tennessee were too numerous for individual reply. Positions have been filled ... applications filed for future reference. 26-1t

FOR SALE

FOR SALE
One Corliss Type 350 ... Power

Hewes & Phillips Engine

24 × 48, 70 revolutions, on ... -foot fly wheel, double crown, 16 × 22-inch ... HARDMAN PECK & CO. 26-3t 633 W. 48th St., N. Y. City

District with Wood Blocks.—The Plans for Raising the "Maine."—Automatic Stops at Railway Danger Signals.

Eng. Lit.

GENERAL LIBRARY,
UNIV. OF MICH.
DEC 29 1910

ENGINEERING NEWS

Founded 1874.
Volume 64. No. 26.
Buyers' Reference, Page 35

220 Broadway, NEW YORK, THURSDAY, DECEMBER 29, 1910.

$5.00 per Year.
Single Copies, 15 Cents
Alphabetical Index of Advertisers, Page 39

MANGANESE STEEL
Wearing parts for
STONE and ORE CRUSHERS
STEAM SHOVELS and DREDGES
CEMENT MACHINERY
MINE CAR WHEELS
BEVEL and SPUR GEARING
REVOLVING SCREENS
Mason Patent Segmental Heads for all sizes of Gyratory Crushers
EDGAR ALLEN AMERICAN MANGANESE STEEL COMPANY
Works: Chicago Heights, Ill. New Castle, Del.
General Office: 191 Michigan Ave., Chicago
Eastern Sales Office: 30 Church St., New York

"BESSEMER PAINT"
made exclusively by
RINALD BROS.
1142-1146 N. Hancock St., Philadelphia

Foundry Equipment
WHITING CRANES, CUPOLAS, LADLES, TUMBLERS, TRUCKS, TURNTABLES, ETC.
Complete Equipments
Gray Iron, Malleable, Steel, Brass, Car Wheel and Pipe Foundries
WHITING FOUNDRY EQUIPMENT COMPANY Harvey Ill.

DR. CHAS. F. McKENNA
Consulting Chemist and Chemical Engineer
Specializing in
QUALITIES OF MATERIALS
INSPECTION
PROCESSES OF MANUFACTURE—RESEARCH
50 Church Street - - New York City

"Lehigh" Portland
CEMENT
High Tensile Strength Finely Ground
Light and Uniform in Color
Recommended for High Class Engineering Work
Manufactured by
LEHIGH PORTLAND CEMENT CO.
ALLENTOWN, PA.
Western Office
725 Rockefeller Building Cleveland, Ohio

LOOMIS FILTERS
Improve System Established 1880 Results Guaranteed
LOOMIS-MANNING FILTER DISTRIBUTING CO.
Main Office, 828 Land Title Bldg., Philadelphia, Pa.
New York Boston Baltimore Washington
Buffalo Chicago

LATROBE
Crusher Rolls and Shells
Forged, Punched and Rolled
from SOLID STEEL INGOTS
RAILWAY STEEL-SPRING CO.
General Offices
Cortlandt Building, 30 Church Street, New York

ALLIS-CHALMERS COMPANY
Leading Manufacturers of
CRUSHING AND CEMENT MAKING MACHINERY
Higher Range of Adjustment of Style K Breakers
Facilitates Changing Sizes of Product.
Ask about them.
DISTRICT OFFICES IN ALL PRINCIPAL CITIES

HIGH DUTY PUMPING ENGINES
Vertical Triple Expansion and Horizontal Compound
THE WILLIAM TOD COMPANY, Youngstown, Ohio

THE BEST
VITRIFIED GLAZED CLAY
SEWER PIPE
ALL SIZES WRITE US NOW
EVENS & HOWARD FIRE BRICK CO., 920 MARKET STREET ST. LOUIS, MO.

BLACKMER & POST PIPE CO.
ST. LOUIS
Vitrified Pipe Exclusively
LARGE SIZES A SPECIALTY

YOU know pipe—but do you know our pipe: vitrified pipe—pipe that's different; different and better? Let us tell you about this; and the new prices.
W. S. DICKEY CLAY MFG. CO.
Kansas City, Mo.

MACOMB SEWER PIPE CO. MACOMB, ILL.
Superior Vitrified Sewer Pipe Double Strength Extra Thick Culvert Pipe

YOU ARE INVITED
TO INVESTIGATE
AMERICAN INGOT IRON
IT IS THE BEST RUST-RESISTING IRON MADE
KNOWLEDGE IS POWER. WRITE FOR FULL INFORMATION.
THE AMERICAN ROLLING MILL CO.
MIDDLETOWN, OHIO.
LICENSED UNDER INTERNATIONAL METAL PRODUCTS CO.'S PATENTS

SMITH MIXER
SYMONS CRUSHERS
See our advertisement on page 59

ROBT. WETHERILL & CO. Incorporated
CHESTER, PA.
Manufacturers
CORLISS Engines, Boilers
Heavy Machinery Constructed
New York Office
50 Church St.—Hudson Terminal Bldg.

INDUSTRIAL
PHOTOGRAPHS
Any Size, Time, Place
HEALY
649 Summit Avenue Jersey City, N. J.
Erie R.R. Studio Tel., 2405 Jersey City

STEEL TANKS
Tower Tanks Tank Cars
Standpipes Vats and Kettles
THE KENNICOTT COMPANY
Chicago Heights, Ill.
CHEMISTS ENGINEERS MANUFACTURERS

They Have Stood the Time Test
For 14 Years
"Pioneer"
Mineral Rubber Pipe Coating. Reservoir Waterproofing Asphalt—Specifications on Request
THE AMERICAN ASPHALTUM & RUBBER CO.
600-614 Harvester Bldg., Chicago

GOODRICH
CONVEYOR BELT
Improved Method of Construction.
Write for special literature.
The B. F. Goodrich Company,
Akron, Ohio

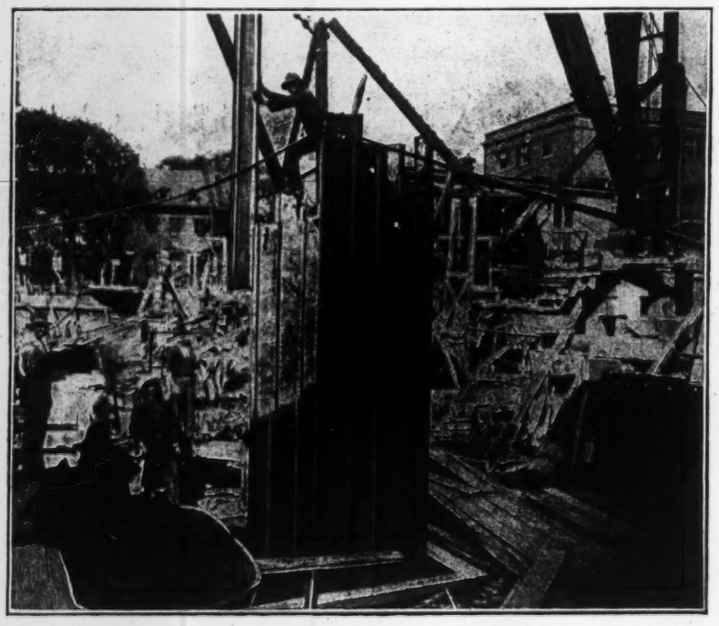
Will Furnish and Erect in
United States and Foreign Countries
Wooden Stave Pipe
REDWOOD MANUFACTURERS CO.
San Francisco
Advertisement is on page 15

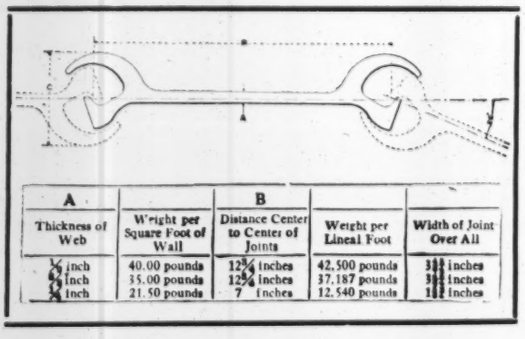
ALL SIZES
Monmouth Sewer Pipe
Made by
MONMOUTH MINING AND MFG. CO.
Monmouth, Ill.

MAKE TIGHT STEAM JOINTS BY USING CORRUGATED COPPER GASKETS FOR FLANGED PIPES CYLINDERS, CHESTS, Etc.
Samples and Circulars free
UNITED STATES MINERAL WOOL CO., 140 CEDAR STREET, NEW YORK CITY

Lackawanna Steel Sheet Piling

Six repeat orders from these contractors





A Thickness of Web	Weight per Square Foot of Wall	B Distance Center to Center of Joints	Weight per Lineal Foot	Width of Joint Over All
⅜ inch	40.00 pounds	12¾ inches	42,500 pounds	3¼ inches
⅜ inch	35.00 pounds	12¾ inches	37,187 pounds	3¼ inches
⅜ inch	21.50 pounds	7 inches	12,540 pounds	1¾ inches

THE Bishop Construction Company, some of whose work is shown below, ordered Lackawanna Steel Sheet Piling last Spring.

Since that time they have purchased various tonnages of Lackawanna Piling on six different occasions, at intervals of one to two months.

Their Piling is of the half-inch web section in 25 foot lengths, weighing 40 pounds to the square foot.

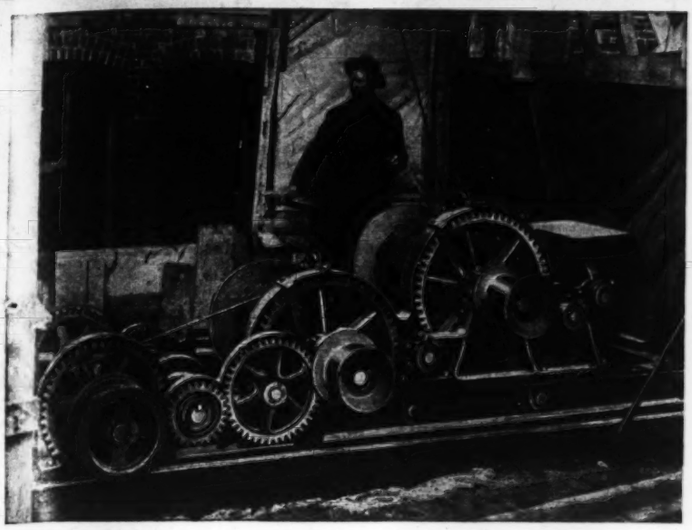
This is not an isolated case. Almost invariably the first order for Lackawanna Piling is merely the beginning and repeat orders follow.

For full information, write nearest office.

Lackawanna Steel Company

General Sales Office: 2 Rector Street, New York

Chicago Detroit Cleveland Boston Buffalo St. Paul
Atlanta Pittsburg Philadelphia Cincinnati St. Louis San Francisco



RUN YOUR HOIST OR MIXER BY GENERAL ELECTRIC MOTORS

Ten general advantages of electric drive for contractors are given below for your serious consideration. Can you afford to be without this cleanly and efficient power?

1. No water, coal or ashes to be carried.
2. Light weight (omission of boiler)—quickly moved.
3. No waiting to get up steam.
4. No fire risk.
5. No smoke nuisance.
6. No fireman.
7. No watchman.
8. No long lengths of leaky steam pipe.
9. No licensed engineer.
10. Power expense only when machine is working.

TEN REASONS FOR USING GENERAL ELECTRIC MOTORS

1. G-E motors are totally enclosed in watertight cases, with dust and watertight bearings—they have often when completely submerged pumped themselves dry and on opening case have been found to be uninjured.

2. This type of motor has been run full speed, stopped, reversed and run in the opposite direction twenty-eight times a minute for several years of heavy service without giving the least trouble.

3. Hardy control system prevents unskilled labor from starting motor too fast.

4. Automatic stops at either end of hoist shaft will cut off motor, and if desired apply brakes at just the instant desired. This system has been proven effective by years of satisfactory service and is an especially desirable feature where the new employers liability laws apply.

5. Should any repair part be needed, motor is arranged to allow immediate repairs with but a few minutes' loss of time.

6. Spare part depots all over the United States facilitate repairs.

7. Bearings are of railway type and require grease very infrequently.

8. Where brushes are used they are self-lubricating and commutator requires practically no attention.

9. Coils are impregnated with waterproof insulating compound and have proven most hardy in service.

10. Careful inspection and test methods, in many cases under operating conditions, assure your getting a motor suited to your particular needs.

KNOTTY PROBLEMS SOLVED FOR YOU

A competent corps of engineers, specializing in the application of motors to construction work for contractors, will carefully answer any questions you may wish to ask on this subject. Neither the inquiry nor its answer places you under any obligation.

General Electric Company

The Largest Electrical Manufacturer in the World

Principal Office: Schenectady, N. Y.

Sales offices in the following cities

Atlanta, Ga.	Denver, Colo.	Philadelphia, Pa.
Baltimore, Md.	Detroit, Mich.	Pittsburg, Pa.
Boston, Mass.	(Office of Sol'g Agent).	Portland, Ore.
Buffalo, N. Y.	Indianapolis, Ind.	Richmond, Va.
Butte, Mont.	Kansas City, Mo.	Salt Lake City, Utah.
Charleston, W. Va.	Los Angeles, Cal.	San Francisco, Cal.
Charlotte, N. C.	Minneapolis, Minn.	St. Louis, Mo.
Chicago, Ill.	Nashville, Tenn.	Seattle, Wash.
Cincinnati, O.	New Haven, Conn.	Spokane, Wash.
Cleveland, O.	New Orleans, La.	Syracuse, N. Y.
Columbus, O.	New York, N. Y.	

2878

Pulsometer Steam Pump

READ WHAT THEY SAY ABOUT THE PULSOMETER

The following few of many Testimonials should be enough to convince the most skeptical that the PULSOMETER STEAM PUMP is the pump to use:

"Bought a Pulsometer 7 years ago, and it has been giving perfect satisfaction ever since."—H. Stevens & Sons, Macon, Ga.

"One of your No. 5 pumps is handling sand in the proportion of 60% water and 40% sand at the rate of 7½ tons sand per hour. We are satisfied it will handle 10 or more tons per hour."—Macklin & Stevenson, McVeytown, Pa.

"I want to say a word of appreciation of your pump. It has given us good service on sewer work, handling a large quantity of water in a muddy condition, and has worked well even when taking in considerable air, which occurs as the sumps are drained."—W. J. Semper, Watertown, N. Y.

"Pulsometer is keeping up the good work."—Wetherell & Bro., Philadelphia, Pa.

"Pulsometer will do all you claim. Will send check for same on the 20th."—E. A. Linc, R.R. Contractor, Lillington, N. C.

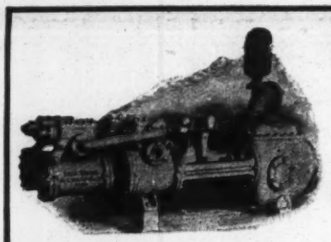
Why not be on the list of satisfied users? Send for catalog.

Illustrated Descriptive Catalogue Gratis

PULSOMETER STEAM PUMP CO.

18 BATTERY PLACE, NEW YORK, U. S. A.

CHICAGO OFFICE, 223-231 NO. JEFFERSON ST.



Dean Steam Pump

Single and Duplex Pumps, Boiler Feeders, Water Supply Pumps, Fire Pumps, Air Pumps and Condensers, Hydraulic Pumps

DEAN BROS. STEAM PUMP WORKS

INDIANAPOLIS, IND.

Effect of Impeller Material Upon Pump Efficiency

Recent investigations have shown that the resistance of a smooth skinned but unmachined cast iron disc rotating in water is about 20% greater than that of a polished brass or bronze disc.

Iron impellers, whether originally machined or not, invariably become rough from rust and corrosion, but the bronze used in the construction of De Laval Impellers assumes, on the other hand, a smooth, burnished surface that both resists corrosion and conduces to the highest efficiency.

If you are interested in centrifugal pump design, send for our new 96-page Book, No. 41, on this subject

DE LAVAL

STEAM TURBINE CO. - - - - Trenton, N. J.

Ad. No. 30A

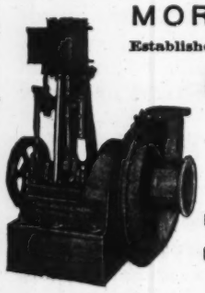
Henry R. Worthington

THE Worthington Compound Packed Plunger Pump is designed for heavy duty where continuity of service is essential.

General Office: 115 Broadway N. Y.

MORRIS MACHINE WORKS

Established 1864 **BALDWINSVILLE, N. Y.**



Centrifugal Pumping Machinery

An experience of forty years ought to count for something in the building of a centrifugal pump. Let us know your requirements and we will recommend the best pump for the purpose.

Correspondence invited.

New York Office, 39-41 Cortlandt Street

HENION & HUBBELL, Agents, 223-231 N. Jefferson St., Chicago

HARRIS PUMP AND SUPPLY CO., Agents, Pittsburgh, Pa.

CAMERON & BARKLEY, Agents, Charleston, S. C., and Tampa, Fla. Charlotte, N. C.

H. A. PAINE, Agent, Houston, Tex.

CENTRIFUGAL AND TURBINE PUMPS

Steam Turbine Driven

TURBINE AND TURBO-VOLUTE PUMPS

Fit Many Services Perfectly

WE BUILD THE COMPLETE UNITS

Alberger Pump Company

140 Cedar Street, New York

205 LaSalle Street, Chicago, Ill.

Farmers National Bank Bldg., Pittsburg, Pa.

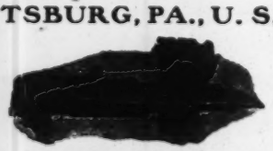
Reeves & Skinner Machinery Company, 617 Chemical Bldg., St. Louis, Mo.

Epping-Carpenter Company

PITTSBURG, PA., U. S. A.

Pumping Machinery for Every Service Pumps with Perfect Balanced Piston Valves

Write for Catalog "B"



Simple, Compound and Triple Expansion Jet and Surface Condensers

Branch Offices:

Mine & Smelter Supply Co., Denver, El Paso, Mexico City, Salt Lake City.

BALTIMORE, MD., T. A. Wilkinson, 915 Equitable Building.

BIRMINGHAM, ALA., Le Sourd & Turner, Brown-Marx Building.

CHICAGO, ILL., B. M. Osbun Co., 832 Commercial National Bank Building.

LOS ANGELES, CAL., Smith-Booth-Usher Co., 212 S. Los Angeles St.

NEW YORK CITY, Epping-Carpenter Co., 90 West St.

SAN FRANCISCO, CAL., L. D. Armstrong, 70 Fremont St.

ST. LOUIS, MO., Reeves & Skinner Machinery Co., Chemical Building.

BUENOS AIRES, ARGENTINE, Mason & Nicol, Calle Cangalto, 324.

Downie Double Stroke DEEP WELL PUMPS

Steam or Electric Driven or Geared from Shaft, are offered for service in elevating large quantities of water from deep Artesian Wells. Single Stroke Pumps for lighter deep well work.

Catalog No. 6

Keystone Driller & Pump Co.

BEAVER FALLS, PA.

EDSON PUMPS (DIAPHRAGM TRENCH)

will handle Sand, Mud, Gravel, Sanitary Deposits and anything limpid enough to flow, without clogging or injury. *Send for Descriptive Catalog.*

ESTABLISHED 1859

EDSON MFG. COMPANY, 278 Atlantic Avenue, Boston, Mass.

ALDRICH ELECTRIC AND POWER PUMPS

"The Standard of Efficiency"

FOR ALL PURPOSES

THE ALDRICH PUMP DEPARTMENT

Allentown, Pa., U. S. A.

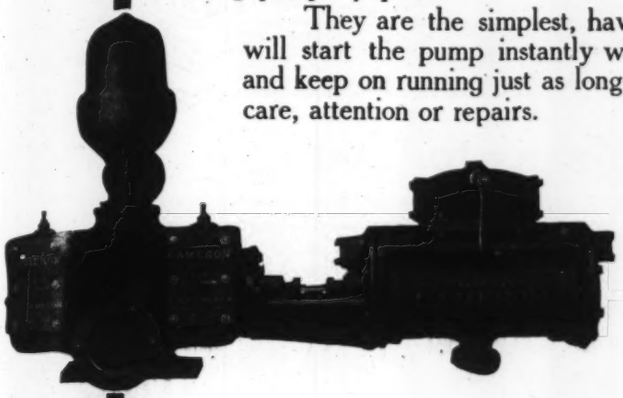
THE SLOGAN OF THE CAMERON: "CHARACTER THE GRANDEST THING"

CAMERON PUMPS

Are noted for continuous service and they give it day after day

This is the one great reason why you should consider the Cameron when installing pump equipment.

They are the simplest, having fewer working parts than any other and will start the pump instantly when you turn on the steam or compressed air; and keep on running just as long as there is water to pump, with little or no care, attention or repairs.



Reliability, Efficiency, Lowest Maintenance Cost

The Cameron long stroke pattern is especially built for station duty and where pumping with maximum suction lift is required.

Note the extra length of the piston stroke, which reduces the wear and tear on the pump, prolongs life and increases its capacity.

Cameron Catalog, Edition "M," illustrates and describes all types and sizes of Cameron Pumps. Sent on request to interested pump users and intending purchasers.

A. S. CAMERON STEAM PUMP WORKS

FOOT OF EAST TWENTY-THIRD STREET NEW YORK CITY

12-29-10

HIGH PRESSURE PUMPING

is no longer represented in its highest development by an old style complicated plunger pump

"American" AMERICAN Centrifugal Pumps

attain 60 to 80 per cent. efficiencies under actual working conditions, cost from one-third to one-half less to install than plunger pumps of equal capacity and there is practically no expense for attendance and repairs.

Compare all of these expenses for a period of years and there is no other pump in existence that will equal the economy of the "American" Centrifugal.

The two stage "American" Centrifugal is guaranteed to develop actual working efficiencies up to 80 per cent. on total heads up to 250 feet. There are no get-out-of-order features about it—it's the highest development of the latest style of pump.

Made in any style, in any number of stages and equipped with any power. Get the new Centrifugal Catalog, No. 117, just off the press.

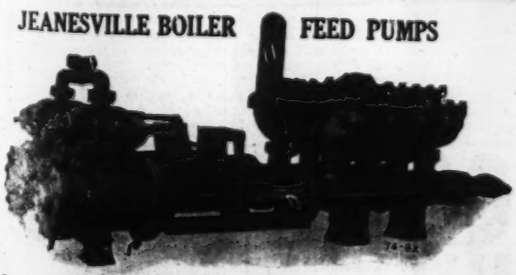
The American Well Works

General Office and Works
AURORA, ILL., U. S. A.
Chicago Office, First Nat. Bank Bldg.

Please Mention ENGINEERING NEWS When Writing Advertisers

Jeanesville Iron Works Company

JEANESVILLE BOILER FEED PUMPS



The Jeanesville line alsoincludes Turbines and Motor Driven Centrifugal Pumps of superior design. Correspondence invited.

General Sales Office, 115 Broadway, New York WORKS AT HAZELTON, PENNA.

We Manufacture the

"HOLMES"

Hydraulically Balanced

Centrifugal and Turbine Pumps

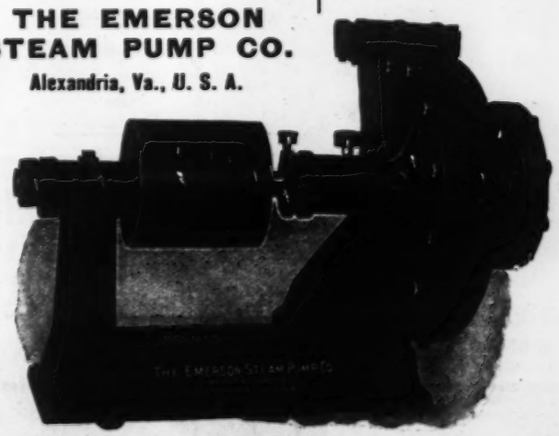
Perfect in design, unequalled in efficiency, these pumps give a greater economy than any other pump on the market.

Our engineering department is prepared to design pumps to meet any special condition of operation. Let us figure on your requirements. Satisfaction guaranteed.

Send for Bulletin I-N

THE EMERSON STEAM PUMP CO.

Alexandria, Va., U. S. A.



OTTO Why OTTO Products are Cheapest OTTO

What Our Success Means to You

SOME SUCCESSES

are of the brass band variety. Some of them spring up much like fungus that rises over night, only to wither with the first sun.

But the success of the Otto has been different, for 34 years now we've been building—working out a consistent, steady growth.

In 1876 the Otto was the *only* practical gas engine, and year after year since that time has the Otto forged ahead, each year seeing its improvements and resultant growth of business and reputation.

Today, with over 100,000 Otto Engines and over 11,000 Otto Suction Gas Producers in successful operation, the Otto Gas Engine Works, with seven factories in various countries, is the oldest and most successful company in the world manufacturing gas and gasoline engines.

Now, the significance of this to you is—

The Otto Company could not possibly have attained a degree of success beyond *all* others if the Otto *products* had not also been superior to all other gas and gasoline engines.

And, as noted before, it is of still further significance that this success is entirely due to the merits of the Otto products —we having never resorted to "brass band" methods.

Now, if you are more interested in *past accomplishments* than *present claims*, we want to tell you more about Otto products.

That's why the coupon is attached —so that you can drop us your name and address by tearing it out, signing and mailing it to us.

Please do this now.

COUPON

Otto Gas Engine Works, Phila., Pa.
Gentlemen—Replying to your ad. in *Engineering News*, Dec., send me catalogs, etc., together with approximate estimate for installing Otto Suction Gas Producer Plant of.....H.P.

Name.....
Firm Name.....
Address.....
Business.....

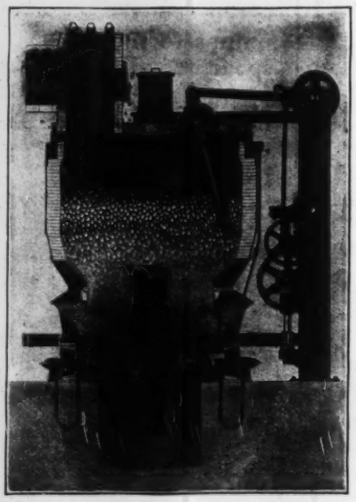
The Otto Gas Engine Works, 3209 Walnut St., Philadelphia, Pa.

Branches: Chicago, Boston, New York, Pittsburg, Omaha, Kansas City, Minneapolis, San Francisco

THE WELLMAN-SEAVER-MORGAN CO.
WELLMAN-SEAVER-MORGAN ENGINEERING DIVISION ENGINEERS AND MANUFACTURERS WEBSTER, CAMP & LANE DIVISION

The Hughes Continuous Gas Producer

MECHANICALLY POKED TYPE



ADVANTAGES

Elimination of Hand Poking Labor

Perfect Distribution of Coal

Better Quality and More Uniform Supply of Gas

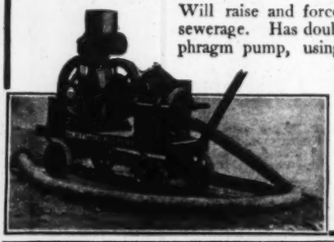
More Gas Produced Per Square Foot of Producer Area

SEND FOR CATALOGUE

GENERAL OFFICES: CLEVELAND, OHIO.

BRANCH OFFICES:
New York, Hudson Terminal — San Francisco, Marvin Building
Mexico, D. F., Apartado 1220-14 a de Guerrero 3326
Denver, 611 Ideal Building

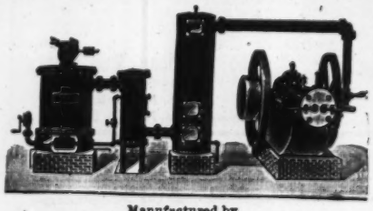
Contractor's Mud Pump



Will raise and force water containing gravel, sand, mud or sewerage. Has double the capacity of the ordinary hand diaphragm pump, using 3 in. suction at one-tenth the cost. Complete outfits, including engines and pumps mounted, suction and discharge hose with brass fittings. Ready for operation. Duplicate parts carried in stock.

Manufactured by
A. A. PARKER
Waterford, N. Y.

NEW ERA GAS ENGINES CATALOG FREE
1½ to 150 H.P. For Gas or Gasoline — THE NEW ERA GAS ENGINE CO., 37 Dale Avenue DAYTON, OHIO

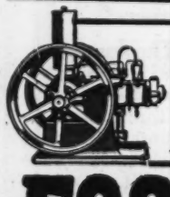


Backus Suction Gas Producers and Gas Engine

Can be operated on 1 to 1 1-4 lbs. anthracite pea coal per h.p. per hour. A saving of 60 to 75 per cent. over steam power.

Write for Catalogue P.

Manufactured by
BACKUS WATER MOTOR COMPANY
Philadelphia, Pa., 109 North Sixth St. — Newark, N. J. — Chicago, Ill., 40 Dearborn St.
45 Washington St., N., Boston, Mass.



THE MIETZ & WEISS OIL ENGINES
Marine, 2 to 400 H.P. Over 100,000 H.P. in operation. Stationary, 2 to 400 H.P.
USE KEROSENE, FUEL OILS, ALCOHOL AND CRUDE OIL
Direct Connected Generators, Pumps, Hoists, etc. *Send for Catalogue*
A. MIETZ, 119 MOTT STREET, NEW YORK
Selling Agents: B. M. Osbun Co., Commercial Nat'l Bank Bldg., Chicago, Ill.; Northwestern Iron Works, 1037-1041 Railroad Ave., S. Seattle, Wash.; Frank B. Davis, 101 High St., Boston, Mass.

FOOS GAS ENGINES
Specially Designed for Electric Lighting

Valves may be removed without disturbing cylinder head.
Main Bearings may be removed without disturbing crank shaft.
Bearings on connecting rod may be adjusted without reaching up to the piston.

Ask for Catalogue No. 43

THE FOOS GAS ENGINE COMPANY, Springfield, Ohio

TAPERING

Reinforced

Concrete Chimneys

Monolithic Construction

Booklet on request

General Concrete Construction Co.

1309 Manhattan Bldg., Chicago

New York Office: 30 Church St.

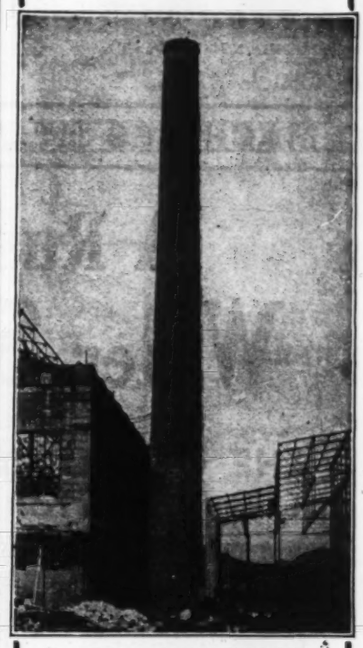
WEBER

REINFORCED CONCRETE

CHIMNEYS

CONIFORM AND CYLINDRICAL TYPES

HUNDREDS IN USE



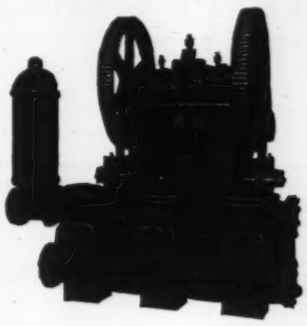
WEBER CONIFORM CHIMNEY
Height, 200 feet. Inside diameter, 12 feet.
Built for Miami Copper Co., Miami, Ariz.

THE WEBER CHIMNEY CO.

207 State Street, CHICAGO, ILL.

New York Office, 30 Church Street

PUMP INSURANCE



THE installation of Goulds Mine Pumps is the best kind of insurance against loss due to failure of a pumping system. In addition to this protection you have the assurance that no other pump, or system of pumping, is more efficient and economical. Do you thoroughly understand the basis of our claims for Goulds Triplex Power Pumps? We solicit the privilege of going into details. Write us today.

The Goulds Mfg. Co.

19 W. Fall St., Seneca Falls, New York

Branches in all large cities

Jackson

LATEST IMPROVED

DEEP-WELL TURBINE PUMP

For Bored Wells.

No Valves

No Plungers

To Get Out of Order.

Highest Efficiency

Write for Catalog 122 EN

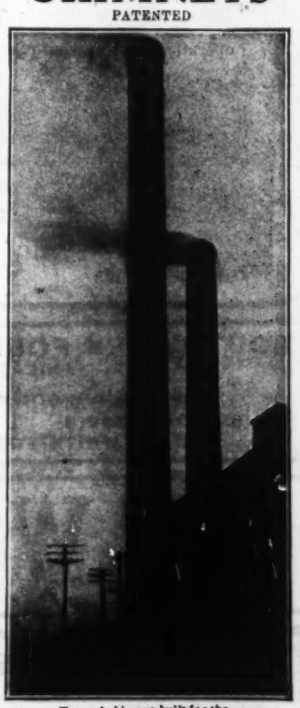
BYRON JACKSON IRON WORKS

351-355 Market St. San Francisco Cal.

WIEDERHOLDT SYSTEM

REINFORCED RADIAL TILE CHIMNEYS

PATENTED



Tapered chimney built for the COMMONWEALTH STEEL CO., Granite City, Ill.
Height, 150 feet. Inside diameter, 7 feet.

No Wood Forms. No Delays. Lined and Covered with Fireclay. Economical. Indestructible.

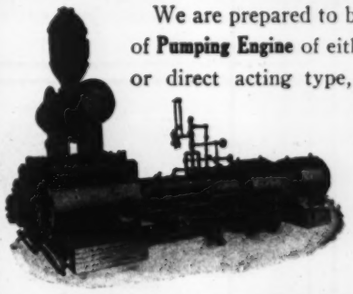
Send for new Illustrated catalog.

Built Exclusively by

WIEDERHOLDT CONSTRUCTION CO.

806-807 New Nat'l Bank of Comm. Bldg., St. Louis, Mo.

STEAM PUMPING ENGINES



We are prepared to build the most advanced type of **Pumping Engine** of either the crank and fly-wheel or direct acting type, for **Water Works, Mines** or **Irrigation**; and centrifugal where adaptable.

R. D. WOOD & CO.

400 Chestnut Street

PHILADELPHIA

RADIAL BRICK CHIMNEYS

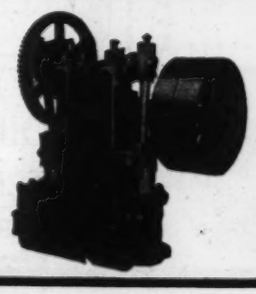
For POWER PLANTS, CHEMICAL WORKS, GARBAGE DISPOSAL PLANTS AND OTHER PURPOSES

Catalog No. 36 will be sent free upon request

THE M. W. KELLOGG CO.

Fulton Building, Hudson Terminal, New York

DEMING POWER PUMPS



FOR GENERAL SERVICE

THE DEMING CO.

Salem, Ohio

Henion & Hubbell, Chicago
Harris Pump & Supply Co. Pittsburgh, Pa.
Other agencies in principal cities

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

BABCOCK & WILCOX - - STIRLING - - RUST

WATER TUBE STEAM BOILERS

STEAM SUPERHEATERS - - MECHANICAL STOKERS

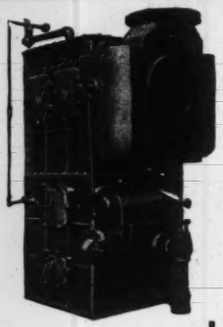
WORKS: BAYONNE, N. J. BARBERTON, OHIO

BRANCH OFFICES:

ATLANTA, GA., Candler Bldg.
BOSTON, 10 Post Office Square.
CHICAGO, Marquette Bldg.
CINCINNATI, O., Traction Bldg.
CLEVELAND, New England Bldg.
DENVER, 435 Seventeenth Street.
LOS ANGELES, American Bank Bldg.
NEW ORLEANS, Shubert Arcade
PHILADELPHIA, North American Bldg.
PITTSBURG, Farmers' Deposit Bank Bldg.
PORTLAND, ORE., Wells Fargo Bldg.
SALT LAKE CITY, 313 Atlas Block.
SAN FRANCISCO, 99 First Street
SEATTLE, WASH., Mutual Life B[ldg.]
HAVANA, CUBA, 116½ Calle de [illegible]

For Testing Iron, Steel Chains, Cloth, Cement, Springs, etc. **RIEHLE U. S. TESTING MACHINES** RIEHLE BROS. TESTING MACHINE CO. 1424 NORTH 9TH STREET PHILADELPHIA

Exhaust Steam Heating Systems Are as Reliable and As Easily Managed as Live Steam Heating Systems, if Properly Designed

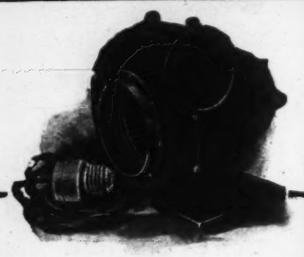


All you need is suitable equipment for purifying of oil the exhaust steam used in the heating system, and for the receipt of the returns and their reheating, so that they may be used over again for boiler feed, together with suitable automatic arrangements for admitting the raw make-up water required, and suitable valves for controlling the flow of steam. In other words, you need the equivalent of oil separator, a trap to drain the same, a returns tank, a feed water heater, an automatic make-up water regulator, and the valves, piping, tees, elbows and other fittings, required for their installation.

All these appliances are combined in the new Improved Cochrane Steam-Stack and Cut-Out Valve Heater and Receiver, which differs from the ordinary heater and receiver in that the oil separator attached to and forming a part of it is of sufficient capacity to purify of oil all the steam exhausted by the engine, including that which is used in the heating or drying system, as well as that condensed in heating the feed water.

This combined heater and separator makes a much more compact, simple and convenient installation than a heater with an independent separator in a by-pass and reduces the first cost of the installation by $50 to $500, depending upon the size of the plant. It is adapted for use with any of the commercial exhaust steam heating systems, and if you would be interested in its application in connection therewith, or if you have charge of, or own an exhaust steam heating system, we would be pleased to send you our *Exhaust Steam Heating Encyclopedia*, a 120-page book containing numerous diagrams, tables and other data.

HARRISON SAFETY BOILER WORKS
3166 N. 17th St. PHILADELPHIA, PA.



"Sirocco" TRADE MARK.

Electric Ventilating Sets will meet hundreds of ventilating, cooling and drying problems—simply and economically.

Outfits with motors wound for most commonly used Lighting Circuit Voltages

Carried in Stock for Immediate Shipment

Write, Wire or 'Phone for Prices

AMERICAN BLOWER COMPANY
DETROIT MICH. U. S. A.

A Russell Water Softener

MADE BY

THE GEM CITY BOILER CO.

DAYTON, OHIO

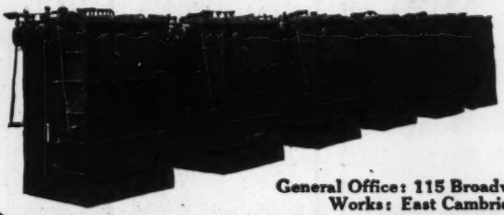
is installed in the National Cash Register Company's Model Factory of the World. Superiority of Construction and Simplicity of Manipulation influenced the Committee after an inspection in operation of all types of Softeners to decide on the "Russell."

The Blake & Knowles Steam Pump Works

Blake-Knowles Open Feed Water Heaters

Increase boiler efficiency

BLAKE-KNOWLES Heaters successfully combine in one apparatus the functions of *Feed Water Heater—Oil Separator—Purifier and Automatic Receiver.* Necessary to the economical operation of any steam plant. Correspondence invited.



General Office: 115 Broadway, New York
Works: East Cambridge, Mass.

WE SUPPLY
BOOKS ON ANY SUBJECT
Engineering News Book Department

As 18-K is to the Jeweler,
The mark **DARLING** is to the Valve user
The **BEST**
THE DARLING PUMP & MFG. CO., Lim.
Box E Williamsport, Pa. A-12

INTERNALLY FIRED
BOILERS

SCOTCH
DRY AND WATER BACK
ALSO—
CORNISH AND LANCASHIRE TYPES

KINGSFORD FOUNDRY & MACHINE WORKS
OSWEGO :: :: NEW YORK

SOUTHWARK FOUNDRY & MACHINE CO.
PHILADELPHIA, PA.
Porter-Allen and Corliss Steam Engines
Weiss Condensers Pumping Machinery
WRITE FOR PARTICULARS

BOOTH WATER SOFTENER

Clean Boilers
No wasted fuel.
No scale to remove.

Uninterrupted service from boilers at high efficiency.

All these are yours if you install our softener. Ask for free booklet.

L. M. BOOTH CO.
136 Liberty Street NEW YORK
CHICAGO: Fisher Building

FIRE AND WATER TUBE
BOILERS

SELF SUPPORTING **STEEL STACKS**

E. KEELER COMPANY
Williamsport, Pa.

Any of Our Bulletins Sent Upon Request

Catalog "EN106"—*The Book of the Economizer.*
Bulletin "EN109"—*Heating and Ventilating.*
Bulletin "EN112"—*Heating Water and Air in Breweries and Malt Houses.*
Bulletin "EN121"—*Green System of Automatic Draft Control for Steam Boilers.*
Bulletin "EN126"—*Drying in Industrial Plants.*
Catalog "EN127"—*Green's Steel Plate Fans.*
Bulletin "EN131"—*Heat Economy in Paper Mills.*
Bulletin "EN132"—*Power For Cement Mills From Waste Heat.*

THE GREEN FUEL ECONOMIZER CO., MATTEAWAN, N. Y.

"Saved 40% of the coal pile"

by using Curtis Steam Turbine Generators

Users of Curtis Turbines feel proud of their possession. One user writes:

"We have a 50 H. P., 200 R. P. M., automatic engine driving a 35 Kw. compound wound generator which we use in connection with our turbine for lighting the city of R——. We have made tests running the turbine and engine on alternating nights, off the same boiler and under the same conditions of load, steam pressure and exhaust, and find that for the same run and load the engine set requires 1500 pounds of coal against 900 pounds for the Curtis Turbine, or **a saving in coal in favor of the turbine of about 40 per cent.** We have called it a saving of 40 per cent, but it is really more than that when you take into account the saving in oil, waste, care and attention which the turbine has over the engine. In the turbine we use the same oil over and over again for from thirty to forty days; after this we remove the oil from the turbine, in which there is practically none wasted, and use this oil on pumps and other apparatus around the station."

Where comparisons are made the full value of the Curtis Steam Turbine Generator Sets is apparent.

Curtis Steam Turbine Generators are made in sizes suitable for every use. The smallest will furnish current for 100 incandescent lamps. The largest will fill any commercial requirement.

The short cut from heat to work

There is only one way of changing the heat of steam into mechanical work—that is, through expansion of the steam. There are, however, several ways of using it. One is to expand and expel it alternately as is done in the ordinary steam engine. The other is to keep up a constant change of heat into work as is done by the continuous expansion of steam in the Curtis Steam Turbine.

The steam turbine method obviously has the advantage

The Curtis Steam Turbine does away with sliding contacts and backward motion.

Rotary motion is required by the electric generator and rotary motion is supplied by the turbine.

The power is supplied at the proper generator speed and the turbine and generator are keyed on the shaft *in one solid unit.*

Owing to its simplicity it requires little care or attention and due to its correct mechanical construction it runs with very little steam.

Electricity comes the direct way through Curtis Turbine Generators

General Electric Company

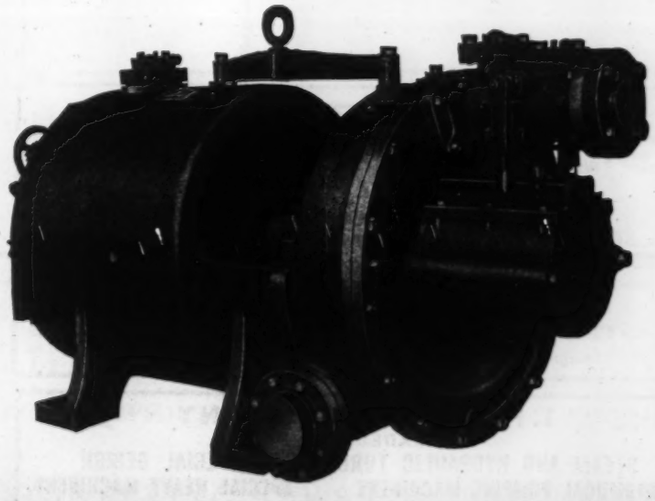
Largest Electrical Manufacturer in the World.

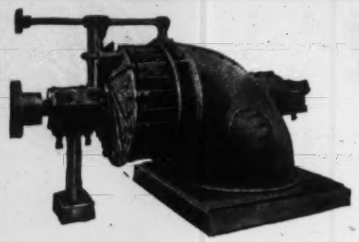
Principal Office: Schenectady, N. Y.

SALES OFFICES IN THE FOLLOWING CITIES:

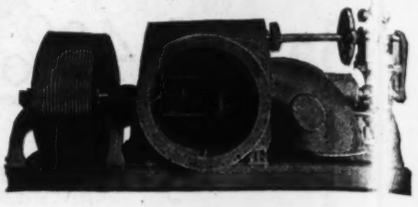
Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charlotte, N. C.
Charleston, W. Va.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Columbus, O.
Denver, Colo.
Detroit, Mich.
Indianapolis, Ind.
Kansas City, Mo.
Los Angeles, Cal.
Minneapolis, Minn.
Nashville, Tenn.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Philadelphia, Pa.
Pittsburg, Pa.
Portland, Ore.
Richmond, Va.
Salt Lake City, Utah
San Francisco, Cal.
St. Louis, Mo.
Seattle, Wash.
Spokane, Wash.
Syracuse, N. Y.

2835



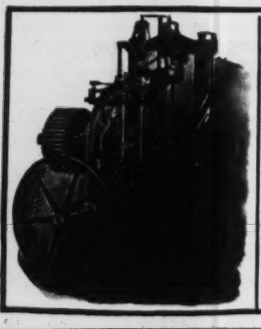


SAMSON TURBINE



If the SPEED of the turbine is to be controlled by a GOVERNOR, the turbine should be of such capacity that it will develop the MAXIMUM POWER required, when operating at ⅞ to ⅞ gate, then when an overload is thrown on, the governor can open the gates wider and allow an increase in power. The EFFICIENCY of the SAMSON between ¾ and ⅞ gate is over 84 per cent.

JAMES LEFFEL & COMPANY, 302 LACONDA STREET, SPRINGFIELD, OHIO, U. S.

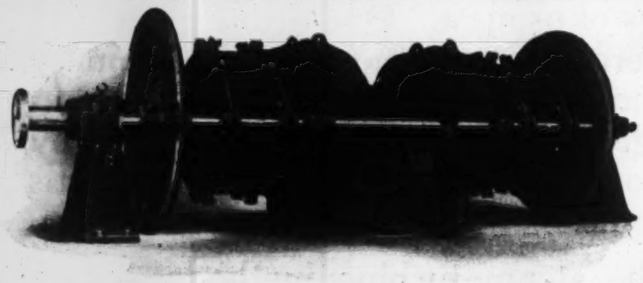


BUILDING GOVERNORS

is not a side issue with us. We have done nothing else for sixteen years. We ought to know how by this time, for we have governed several million horse power of water wheels in hydro-electric plants. We have but one standard: the best that money can produce. Though not the lowest in price, our governors are the cheapest to buy. We have interesting printed matter which is yours for the asking. Ask for it.

THE LOMBARD GOVERNOR COMPANY ASHLAND, MASS.

The N-14 GOVERNOR. 60,000 ft. lbs. capacity



Smith and McCormick Turbines

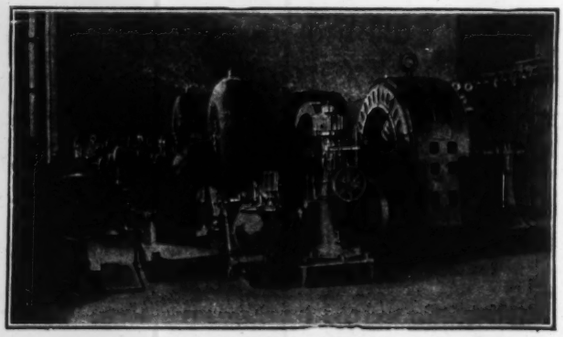
Equipped with both Wicket and Cylinder Gates

Engraving represents one of six units each incased in steel flume, developing 5200 horse power at 225 R. P. M. under 60 feet head. In operation in a plant of the Southern Power Co., Charlotte, N. C.

Correspondence Solicited

S. MORGAN SMITH COMPANY, York, Pa.

Branch Offices: 644 American Trust Bldg., Chicago, Ill. 176 Federal St., Boston, Mass.



PELTON-FRANCIS TURBINE INSTALLATION,

WATER POWER PLANTS INSTALLED
TURBINES OF ANY CAPACITY

Regulation and Efficiency Guaranteed Engineers' Specifications Requested

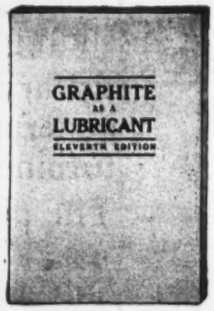
THE PELTON WATER WHEEL CO.

1199 Monadnock Bldg. San Francisco, Cal.

95 West Street New York City

F-6

Read Up On Graphite Lubrication



Knowledge is power. Even though you have no occasion to use graphite now, there is likely to come a time when you will find it at least desirable to know something about it.

This latest edition of "Graphite as a Lubricant" will tell you what you want to know in concise form. Published by the oldest and largest graphite concern in the world.

Write for free copy 43-C.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

STANDARD GOVERNORS

FOR WATER WHEELS

Send For Bulletins Illustrating

Standard Horizontal Type

Standard Vertical Type

Standard Rotary Type

Sizes up to 60000 ft. lbs. capacity

LUDLOW VALVE MFG. CO.

(Sturgess Dept.) TROY, N. Y.

The Hodge Boiler Works

Stand-Pipes Boilers Etc., Etc.

East Boston Mass.

Boston Office Room 27 Mason Building

THE HOLYOKE FIRE HYDRANT

Simple, Durable, Satisfactory in Every Respect

Manufactured by

Norwood Engineering Co.

FLORENCE, MASS.

Send for Circulars

ESTABLISHED 1829 **I. P. MORRIS COMPANY** INCORPORATED 1876

PHILADELPHIA, PA.

STEAM AND HYDRAULIC TURBINES OF SPECIAL DESIGN

CENTRIFUGAL PUMPING MACHINERY SPECIAL HEAVY MACHINERY

Land and Marine Boilers Brass and Bronze Castings Iron Castings up to 50 tons

PLAIN LETTERING

By PROF. HENRY S. JACOBY

Most comprehensive book on this subject. Contains standards of U. S. Engineer Corps, U. S. Geological and Geodetic Surveys, and Mississippi River Commission. Cloth, 10 x 7 inches: 82 pages. Price $3.00.

NEW AMERICAN TURBINES

Designed and built for all conditions.

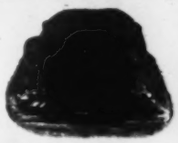
Send for Catalog 36

THE DAYTON GLOBE IRON WORKS CO.

Dayton, Ohio

C-W

induction motors, d. c. motors, alternators, d.c. generators, turbo-generators, motor generators, transformers, etc., are built by a company of engineers that has been making good since 1888.



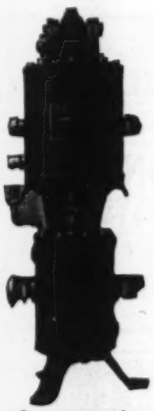
CROCKER-WHEELER COMPANY

Birmingham Boston Chicago Cleveland Philadelphia Pittsburg Denver New York Ampere, N. J., Etc.

Westinghouse

Air Compressors

A COMPRESSOR that operates with absolute reliability while moving over the ground at 60 miles an hour, and otherwise subject to the generally severe conditions of railroad service, has no trouble doing its work when stationary.



Compressor with Reduced Air Cylinder for High Delivery

Westinghouse Steam Driven Compressors for Industrial Use

are identical, in principles of design, with those seen on almost every locomotive in the land for supplying compressed air to the brake system.

A valuable and distinctive feature of Westinghouse Steam Driven Compressors for industrial service consists in the ability to modify the size of the air cylinder so as to secure, with a given steam pressure, either a larger volume of air at lower pressure or a smaller volume of air at higher pressure than with the standard air cylinder.

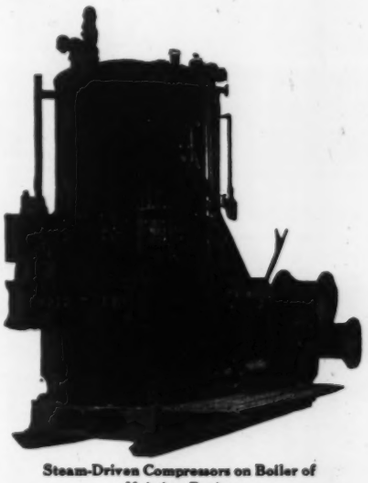
Compact, sturdy design makes these compressors particularly suited to contractors. They can be mounted anywhere.

Our Special Publication No. 9012 describes Westinghouse Air Compressors and auxiliary apparatus, and contains valuable tables; our nearest office will gladly supply you with a copy and expert engineering regarding specific conditions.

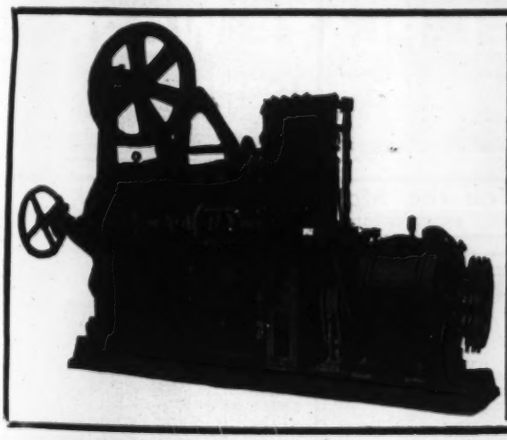
The Westinghouse Airbrake Co., Pittsburg, Pa.

Atlanta, Candler Bldg.
Boston, Exchange Bldg.
Chicago, Railway Exchange Bldg.
Cleveland, Schofield Bldg.
Columbus, Columbus Sav. & Trust Bldg.
Denver, Majestic Bldg.
Houston, Texas, 408 Hawthorne Ave.
Mexico City, Mex., 4a Calle Pte. de Alvarado, No. 100.
New York, City Investing Bldg.
St. Louis, 1932 North Broadway.
St. Paul, Endicott Bldg.
San Francisco, Pacific Bldg.
Portland, Ore., Spaulding Bldg.

For Canada, Canadian Westinghouse Co., Limited, Hamilton, Ontario.



Steam-Driven Compressors on Boiler of Hoisting Engine



INTERRUPTIONS to the elevator service, whether in office building or factory, *mean loss of money.* An electric elevator hoist, no matter how good its mechanical design, depends absolutely upon the motor equipment for efficient, uninterrupted service.

Westinghouse Elevator Motors and Controllers

give that kind of service. They are designed and constructed with only one object—to operate elevator hoists. They are made in capacities and with characteristics adapted to every type of elevator hoist. We have made a special study of the subject; our knowledge is yours for the asking.

Westinghouse Electric & Manufacturing Co.

Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Denver, Detroit, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburg, St. Louis, San Francisco, Salt Lake City, Seattle

Westinghouse Electric & Mfg. Co. of Texas, Dallas and El Paso, Texas.
Canada: Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Mexico: Compania Ingeniera, Importadora y Contratista, S. A., Successors to G. & O. Braniff & Co., City of Mexico

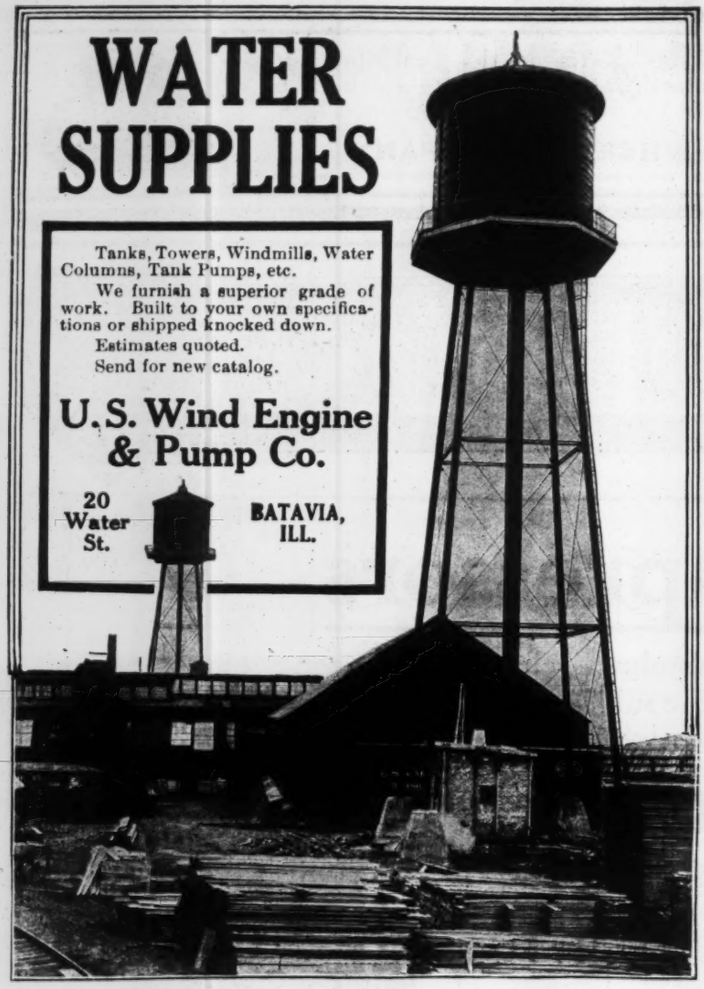
Notice to Advertisers

Cuts and copy for changes in classified advertisements should be received twelve days in advance of date of issue **if proof is desired.**

Changes received ten days in advance can be inserted without proof being submitted.

ENGINEERING NEWS PUBLISHING CO.

WATER SUPPLIES



Tanks, Towers, Windmills, Water Columns, Tank Pumps, etc.

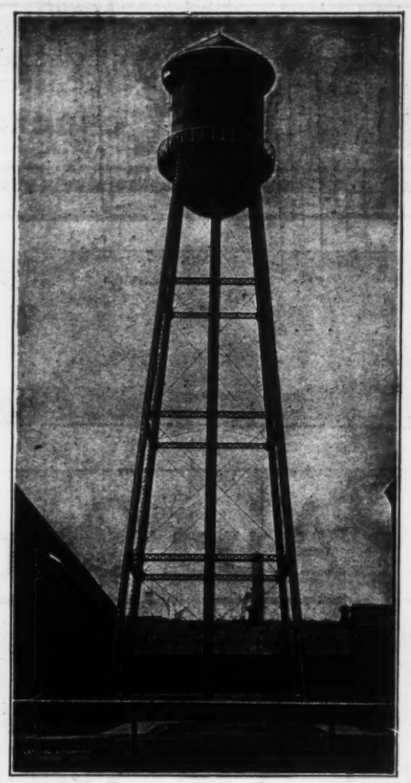
We furnish a superior grade of work. Built to your own specifications or shipped knocked down.

Estimates quoted.

Send for new catalog.

U.S. Wind Engine & Pump Co.

20 Water St. BATAVIA, ILL.



WATER TOWERS

STAND PIPES

TANKS

The design, manufacture and installation of these structures has been our specialty for 50 years. Our customers get the benefit of this long experience. Special designs cheerfully made to meet unusual conditions.

Write for Catalog

TIPPETT & WOOD

Phillipsburg New Jersey

TREADWELL CONSTRUCTION CO.

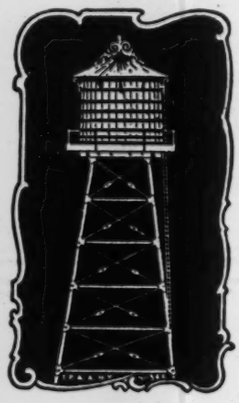
MIDLAND, PA.

PLATE AND CONSTRUCTION WORK

TANKS BLAST FURNACES LADLES
RIVETED STEEL PIPE STACKS GENERAL FABRICATING

Pittsburg District and Pittsburg Freight to Common Points

"The Tanks with a Reputation"



The Caldwell Tank and Tower

represent the highest type of engineering construction.

Tank durability and tower stability are embodied in every ounce of material and manifest in every line of their construction, insuring a lifetime of economical and satisfactory service.

Thousands of mills and factories throughout the country, many the largest of their kind, find the Caldwell service, both for daily water needs and fire protection, eminently safe and dependable. Twenty-five years' experience.

We erect anywhere in the United States, Canada or Mexico.

Write for Illustrated Catalogue, 64-page View Book of Jobs Erected, and references near you.

W. E. CALDWELL CO., Incorporated, **Louisville, Ky.**

TANKS { Steel, Wood / Galvanized } TOWERS Windmills, Pumps Gas Engines

The Meehan Boiler & Construction Company

LOWELLVILLE, OHIO

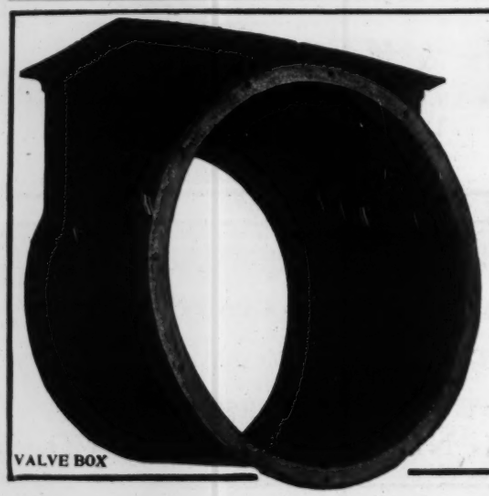
Manufacturers and Erectors

STEEL PLATE WORK

Self Supporting Steel Stacks — Steel Riveted Pipe — Stand Pipes
Blast Furnaces — Storage Tanks — Hot Blast Stoves
Car Tanks — Water Tanks — Gas Washers

FOSTER SUPERHEATERS Insure economical steam consumption on light loads
POWER SPECIALTY COMPANY, Trinity Building, 111 Broadway, New York

Have You the Most Competent Help?
If not, try our "Want" pages, for immediate results. Three cents a word.



VALVE BOX

The Petroleum Iron Works Co.

Sharon, Pa.

All Classes of

Steel Plate Construction

BRANCH OFFICES

50 Church Street
New York City, N. Y.

Farmers' Bank Building
Pittsburgh, Pa.

Pierce Building
St. Louis, Mo.

Brown Marx Building
Birmingham, Ala.

Tulsa, Okla.

WATER TOWERS ALL OVER THE U.S.

Show the class of work we have been building for the past sixteen years for Water Works Plants, Railways and Sprinkler Systems.

We are the only extensive builders of Towers and Tanks having *a Factory in the*

PITTSBURG DISTRICT

Consequently we are in the best position to make low prices on eastern and southern as well as western business.

Write for Catalog No. 1

DES MOINES BRIDGE & IRON CO.

DES MOINES, IA. 922 Tuttle St.
PITTSBURG, PA. 801 Curry Bldg.

Sidney, Neb.
Height 51 ft. Capacity 1,[illegible],000 gals.

American Steel Foundries, Alliance, Ohio. Capacity, 60,000 gals. 111' 6" top.

Chicago Bridge and Iron Works

Engineers *Manufacturers* *Contractors*

DESIGN—MANUFACTURE—CONSTRUCT

Structural Material, Bridges, Turntables, Buildings, Water Towers, Stand Pipes, Gas Holders, Steel Work

Metal Structures for any service

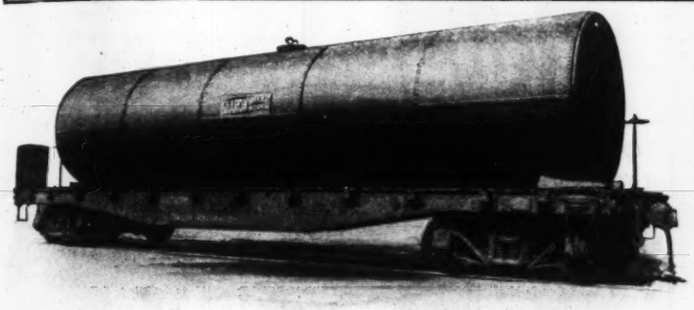
Our Catalogue No. 10 mailed to any address upon request

MAIN OFFICE
105th and Throop Streets
Chicago

BRANCH OFFICES
30 Church Street, New York
Praetorian Building, Dallas, Tex.

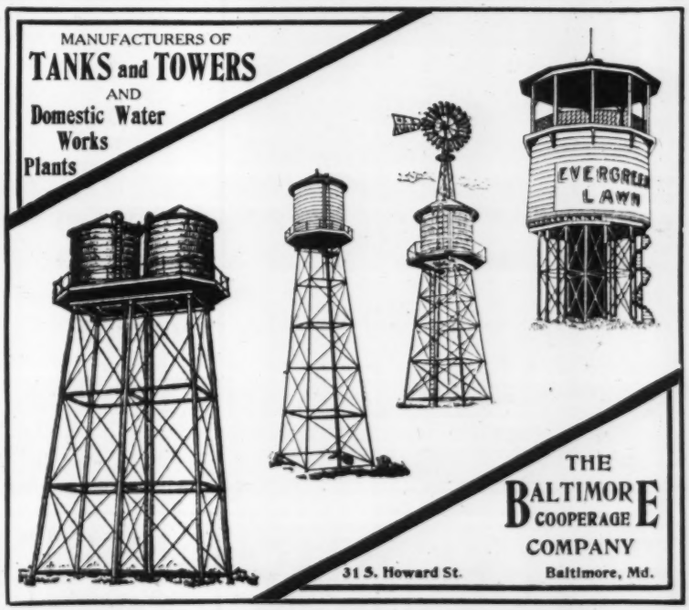
SHOPS: CHICAGO, ILL.; GREENVILLE, PA.

Kiel, Wisconsin. Capacity, 60,000 gals. 107' 6" top.



SHARON BOILER WORKS Dock and Florida Sts. SHARON, PA.
PLATE WORK of all kinds
STRUCTURAL WORK Wheeler Vertical Water Tube Boilers

MANUFACTURERS OF
TANKS and TOWERS
AND
Domestic Water Works Plants



THE BALTIMORE COOPERAGE COMPANY
31 S. Howard St. Baltimore, Md.

Manitowoc Engineering Works

MANITOWOC, WISCONSIN

Kiln Shells Complete
Dryers
Coolers
Heavy Plate Work

CHICAGO OFFICE
842 MONADNOCK BLOCK

MAGINNIS GALVANIZED STEEL FLUME

Double Channel Flume, U. S. R. S. Belle Fourche Project. Capacity, 225 cu. ft. per sec.

NO RIVETS NO SOLDER — A FLUME THAT NEVER LEAKS — ANY SIZE ANY LENGTH

Send for full Descriptive Catalogue

T. C. EGLESTON, Sales Manager, 714 Ideal Building, Denver, Colo.

ADVANCE NEWS is always wanted for our CONSTRUCTION NEWS and our readers are often in a position to send us such items. We ask to be kept informed of new work.

DEEP WATERWAY FROM ST. LOUIS TO CAIRO: REVIEW OF SEVEN PROPOSED PLANS.
By *J. W. Woermann*, Engineers' Club of St. Louis.

THE HYDRO-ELECTRIC POWER PLANT ON THE JHELUM RIVER, IN KASHMIR, INDIA.
By *Heinrich Homberger*, Technical Society of the Pacific Coast.

MANGANESE STEEL: WITH DISCUSSION.
By *F. E. Johnson*, Utah Society of Engineers.

30 Cents per Copy — JOURNAL OF THE ASSOCIATION OF ENGINEERING SOCIETIES — $3.00 per annum

NOVEMBER, 1910

FRED. BROOKS, Secretary, 31 Milk Street, Boston, Mass.

RIVETED STEEL PIPE ... CAR TANKS

LONG, EASY CURVES, with *full length* bell and spigot pipe, without the use of special curves.

A slight adjustment in the bell when laying is possible in the standard bell and spigot joint.

CAST IRON PIPE

A Long, Easy Curve with Full Length Pipe

Used for water and gas mains has many advantages over other kinds.

The largest water and gas interests in the United States use CAST IRON PIPE almost exclusively.

Also for Sewage, Drains, Culverts, etc.

All regular sizes 3 inches to 84 inches

Flange Pipe, Flexible Joint Pipe, Specials, Heavy Castings

United States Cast Iron Pipe & Foundry Co.

WORKS:

ADDYSTON, OHIO — BURLINGTON, N. J. — COLUMBUS, OHIO
ANNISTON, ALA. — CHATTANOOGA, TENN. — LOUISVILLE, KY.
BESSEMER, ALA. — SCOTTDALE, PA. — SUPERIOR, WIS.
BUFFALO, N. Y. — CLEVELAND, OHIO

General Office, 71 Broadway, New York

Eastern Sales Office—71 Broadway, New York
Western Sales Office—618 Rookery, 217 La Salle St., Chicago, Ill.
Southern Sales Office—Chamberlain Bldg., Chattanooga, Tenn.
Philadelphia Sales Office—Land Title Bldg., Philadelphia, Pa.
Pittsburg Sales Office—Murtland Bldg., Pittsburg, Pa.

Trade Mark

"LEADITE"

Registered U. S. Pat. Office

For Water Works

Makes a permanently tight joint witho caulking at about half the cost of lea Joints made with "Leadite" 15 years a have never leaked. Unaffected by expa sion, contraction, electrolysis or vibratio Write for reports of tests, endorsemen and prices. Write to-day.

THE LEADITE CO., I C.
1232 Land Title Building, PHILADELP A

British Representative:
H. S. Dickinson, 42 Union St., Bradford, Yorks., I

JOHN FOX. NICHOLAS ENGE.

JOHN FOX & CO.

CAST-IRON WATER, GAS AND FLANGE PIPES

SPECIAL CASTINGS, FIRE HYDRANTS, VALVES.

GENERAL FOUNDRY AND MACHINE WORK.

253 BROADWAY. NEW YORK CITY.

The Massillon Iron and Steel Co., The Rookery, Chicago, Ill. Works and Office, Massillon, Ohio

Cast Iron Pipe For Water, Gas and Culverts. Flange Pipe and Fittings a Specialty

WATER, GAS, CULVERT

Heavy Castings In Loam, Green Sand or Dry Sand for Blast Furnaces, Rolling Mills, etc.

ENGINEERS—FOUNDERS—MACHINISTS

FOUNDRIES LYNCHBURG, VA. READING, PA.

M. J. DRUMMOND & CO.

MANUFACTURERS OF CAST IRON FLANGE GAS AND WATER PIPE

"GLAMORGAN" FIRE HYDRANTS, VALVES AND VALVE BOXES, LAMP POSTS AND SEWER CASTINGS.

GENERAL SALES OFFICE, 182 BROADWAY, NEW YORK.

111 BROADWAY. NEW YORK CITY.

WARREN FOUNDRY AND MACHINE CO.

MANUFACTURERS OF CAST IRON GAS AND WATER PIPE

ALSO ALL KINDS OF FLANGE PIPE AND SPECIAL CASTINGS.

THE DIMMICK PIPE CO.

Manufacturers of

CAST IRON PIPE

For WATER WORKS, GAS WORKS, CULVERTS, Etc.

Iron Castings of Every Description

GENERAL OFFICE, BIRMINGHAM, ALA.

Kansas City, Mo., 501 Scarritt Bldg. — Philadelphia, Penna., 2022 New Land Title Bldg.
Cincinnati, O., 54 Pickering Bldg. — Chicago, 431 The Rookery
Seattle, Wash., 108 White Bldg. — San Francisco, Cal., Balboa Bldg.

GEORGE ORMROD, Pres. and Treas.
JOHN D. ORMROD, Vice Pres. and Supt.
J. G. EBERLEIN, Secy.

EMAUS PIPE FOUNDRY

DONALDSON IRON CO.

Manufacturers of CAST IRON PIPE and Special Castings for Water and Gas.

Also FLANGE PIPE, LAMP POSTS, Etc.

All Pipes Cast Vertically.

Emaus, Lehigh County, Pa.

FOR WATER AND GAS WORKS
McWANE PIPE WORKS
Main Office: Lynchburg, Va.
Eastern Office: 220 Broadway, N. Y.

STANDARD CAST IRON PIPE & FOUNDRY CO.

BRISTOL PENN

Inquiries Solicited for Castings of Every Description

GLAMORGAN PIPE & FOUNDRY CO.

LYNCHBURG, VA.

Manufacturers of

Cast Iron Water and Gas Pipe, Special Castings, Flange Pipe and Flanged Specials

Gate and Compression Hydrants, Water, Gas and Steam Valves. General Founders and Machinists.

Eastern Sales Agents, M. J. Drummond & Co., 182 Broadway, New York City — Western Office, 431 The Rookery, Chicago, Ill. J. R. Rice, Manager

CENTRAL STATION HEATING

AMERICAN DISTRICT STEAM CO., Lockport, N.Y.

Originators and Builders of HOLLY SYSTEM OF UNDERGROUND STEAM DISTRIBUTION for the utilization of exhaust steam from Electric and Power Plants for heating purposes. 200 plants in operation. Also manufacturers of WOODEN WATER PIPE and Steam Pipe Casing, Steam Traps, Condensation Meters, Valves, Cooling Coils, Steam Separators and a full line of Steam Fitters' Supplies. Write for our pamphlet and price list.

AMERICAN CAST IRON PIPE CO.

Manufacturers of

CAST IRON PIPE AND FITTINGS

Western Office 718 Scarritt Building Kansas City, Mo.

BIRMINGHAM ALABAMA

Eastern Office 56 Liberty Street New York

CAST IRON PIPE

JAMES B. CLOW & SONS. CHICAGO

Quotations Furnished Promptly.

Lengths 6 to 12 ft. long

Lengths 6 to 12 ft. long

$25,000.00 per mile SAVED!

We can save you this amount on an installation of 48-inch Wyckoff Machine Made Wood Stave Pipe over Cast Iron and

WE CAN PROVE IT

We can save you $10,000.00 per mile on 24-inch

AND IT LASTS AS LONG

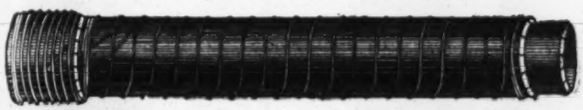
Sizes 1 inch to 48 inches in diameter. Pressures 10 lbs. to 200 lbs.

A. Wyckoff & Son Co., Elmira, N. Y.

Pittsburg Office: 1010 House Building
Southern Plant and Office: Alexandria, La.

WASHINGTON PIPE AND FOUNDRY CO.

LARGEST PLANT OF ITS KIND IN THE WORLD



MANUFACTURERS OF

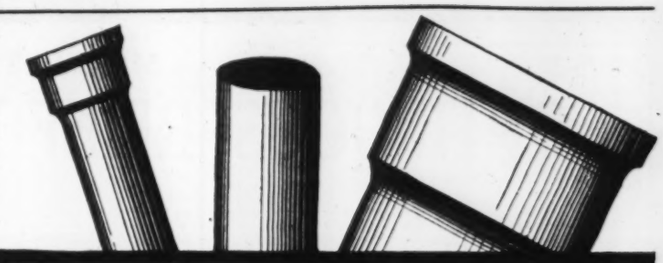
MACHINE BANDED WOODEN STAVE AND CONTINUOUS STAVE PRESSURE AND CONDUIT PIPE.

For Waterworks Systems, Irrigation, Domestic Water Supply, Power Plants, Fire Protection for Cities, Dredge Work, Towns, Mills and Manufacturing Plants, Hydraulic Mining, Salt Water Mains.

INSULATED WIRE CONDUITS, SPECIAL PIPE FOR MINES
WOODEN TANKS AND TOWERS FOR ALL PURPOSES.

STEAM PIPE CASINGS

Office, Factory and Works
1512 to 1620 Center Street and 3001 to 3019 Asotin Street
TACOMA, WASHINGTON, U. S. A.



CHARLES MILLAR & SON CO.

MAIN OFFICE, UTICA, N. Y.

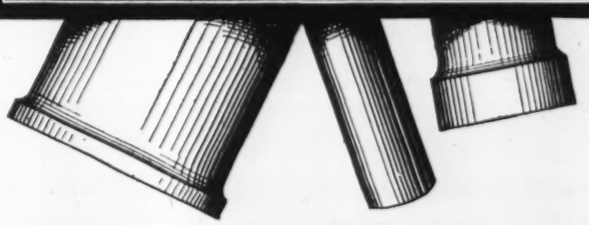
BRANCH OFFICES
176 Federal St. BOSTON, MASS.
150 Nassau St., NEW YORK CITY Story & Stephens

UTICA PIPE FOUNDRY CO.

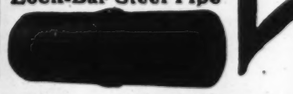
CAST IRON WATER AND GAS PIPE

AND SPECIALS

Cast Iron Flanged Pipe,
Cast Iron Soil Pipe and Screwed Fittings,
Pig Lead, Lead Pipe and Sewer Pipe, Jobbers in Plumbers', Steam Fitting and Mill Supplies. Akron Sewer Pipe.



Lock-Bar Steel Pipe



Before Closing After Closing

Lock-Bar Pipe
Riveted Pipe

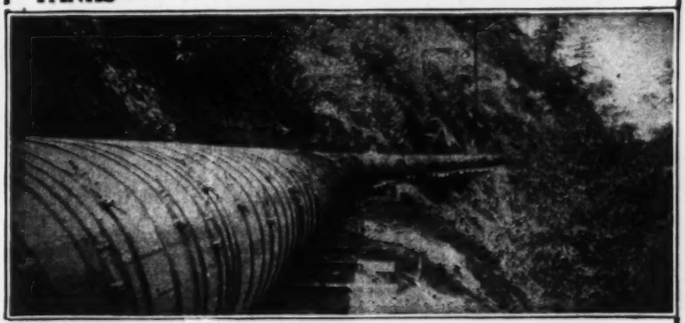
Boilers, Tanks
Caissons, Air Locks
Mud and Steam Drums, High Pressure Cylinders

THE EAST JERSEY PIPE COMPANY

50 Church Street, New York Works, Paterson, N. J.

TANKS and WOOD WATER PIPE

PIPE Sizes 2 in. to 12 ft. Diameter—Pressures to 400 ft. head—made from famous California Redwood and Douglas Fir. For City Systems—Irrigation—Sewers—Power Plants.
TANKS for—Water—Oil—Wine—Mining—Brine—Cyanide Plants—Sprinkler Systems.



Manufactured by
PACIFIC TANK AND PIPE COMPANY
Succeeding National Wood Pipe Company Pacific Tank Company
Send for Printed Matter
318 Market St., San Francisco. Equitable Bank Bldg., Los Angeles. Kenton Station, Portland, Ore.

ROOT SPIRAL RIVETED PIPE

3" to 30" Diameter, Galvanized or Asphalted, For Water, Compressed Air, Exhaust Steam, etc. Light, Strong, Serviceable

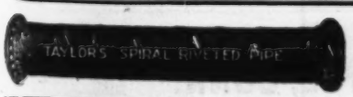
ABENDROTH & ROOT MFG. CO. Works, NEWBURGH, N. Y.
Sales Offices: New York City, 50 Church Street; Chicago, Ill., Commercial National Bank Building

JAMES McNEIL & BRO. CO.

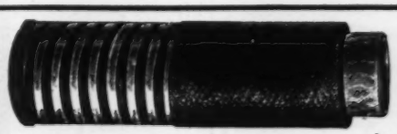
LARGE SIZE RIVETED STEEL PIPE

STAND PIPE IRON TANKS BLAST FURNACES
SELF-SUPPORTING STACKS AND HEAVY PLATE WORK

Pittsburg, Pa.



AMERICAN SPIRAL PIPE WORKS



IMPROVED WOOD WATER PIPE

For Municipal Water Systems

Costs less than metal pipe.
Easily and cheaply laid.
Will not rust nor corrode.
Cheaply and easily maintained.

STEAM PIPE CASINGS
ACIDPROOF PIPE
MINE PIPE
Write for Information

MICHIGAN PIPE COMPANY, Bay City, Mich.

PORTLAND WOOD PIPE CO.

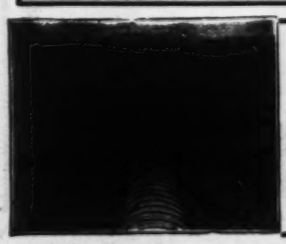
Machine Banded Continuous Stave

WOOD STAVE PIPE

Made of Oregon or Douglas Fir

Write for Information
BOX 71

PORTLAND, OREGON



REDWOOD MANUFACTURERS CO.

916 Balboa Building, cor. 2d and Market Streets
SAN FRANCISCO, CAL.

Continuous Wooden Stave Pipe

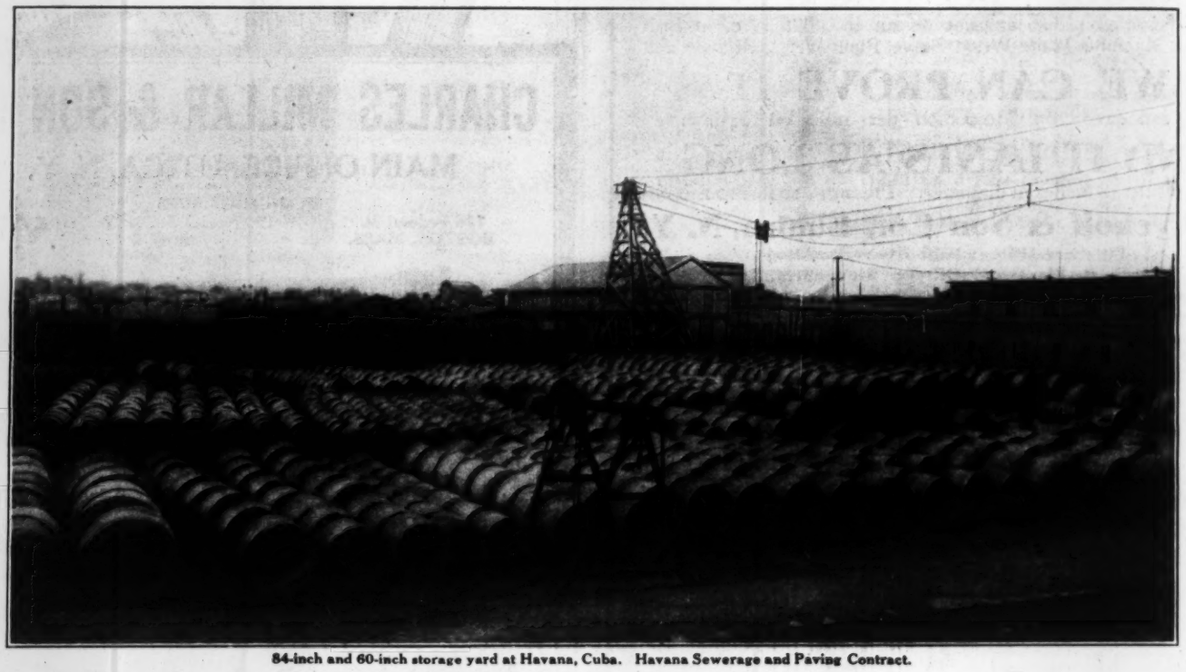
For Irrigation, Municipal Water Supply
Hydro-Electric Power Plants and Out-Fall Sewers

Catalogues and Estimates Furnished on Application
Ask for Catalogue No. 2

MERIWETHER SYSTEM

CONTINUOUS REINFORCED CONCRETE PIPE

Patented



84-inch and 60-inch storage yard at Havana, Cuba. Havana Sewerage and Paving Contract.

LOCK JOINT PIPE COMPANY, - 165 BROADWAY, NEW YORK

WRITE FOR ILLUSTRATED CATALOG

Pacific Lock Joint Pipe Co., Seattle, Wash.
Francis Hankin, Montreal, Canada.

Harris Engineering Company, Louisville, Ky.
F. H. McGavin Co., Ltd., Winnipeg, Canada.
Mexican Steel Products & Machinery Co., S. A., Mexico City, Mexico.

Howard Egleston, Chattanooga, Tenn.
Huston Concrete Company, Havana, Cuba.

YOU CAN OVERCOME

THAT PACKING DIFFICULTY WITH THE ASSISTANCE OF

WEAR WELL LEATHER PACKINGS

Tell us the trouble you have been experiencing. We will study your requirements—select leather especially adapted for your individual wants and make every single Packing to your specifications.

Is it not logical that "Wear Well" Leather Packings made in this way will give you Longer Service and Better Service at a lower cost than other Packings you have been using?

The proof is the test. Write today for samples and descriptive catalogue. They will interest you.

DETROIT LEATHER SPECIALTY COMPANY, INC.

900 BEECHER AVENUE

DETROIT WEAR WELL Regal Metallic PACKING MICHIGAN

For Rapid Work and Convenience

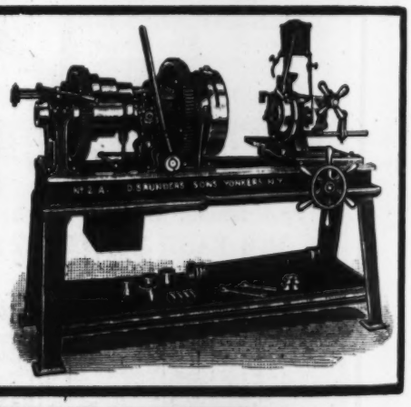
Use our latest Improved

Lever Gripping Chuck Machine

Compact, simple in operation, durable and economical. The most efficient machine of this type presented to the trade.

Send for catalog

D. SAUNDERS' SONS
YONKERS, NEW YORK



SARCO

A product of which pure "Gilsonite" Asphalt is the base—manufactured under processes which make it the most durable, uniform and efficient material known for

Paving--Roofing--Waterproofing--Underground Pipe Dips and Coatings--Mastic Flooring--Paving Filler--Wire Insulation

See our advertisement in last issue of this paper or ask us for literature describing its use for any of the purposes named.

Standard Asphalt & Rubber Co.
205 La Salle Street, CHICAGO

THE SESSIONS FOUNDRY CO.

BRISTOL, CONN. *Low Prices*

Sewer and Subway Manhole Castings

Sewer Catch-Basin Castings, Etc.

TO ORDER

Prompt Shipments
Deliver at any point

Write us for Price

Coffin Valve Co.

Boston, Mass.

Makers of Largest Valves in America

Fig. 211
24 inch Self Contained Sluice Gate.

Send for Catalogue 12-B, if interested

Fig. 210
6 inch Standard Coffin Gate Valve.

Designs and Estimates Furnished Promptly

Fig. 212
48 inch Circular Rising Screw Sluice Gate.

Please Mention ENGINEERING NEWS When Writing Advertisers

ROBERTS WATER FILTERS

ARE RECOGNIZED FOR
Simplicity, Durability and Efficiency
Are ECONOMICAL in Construction and Maintenance

No Condition or Demand Beyond Us. Write

Roberts Filter Manufacturing Company, Inc.
Darby, Philadelphia, Pa.

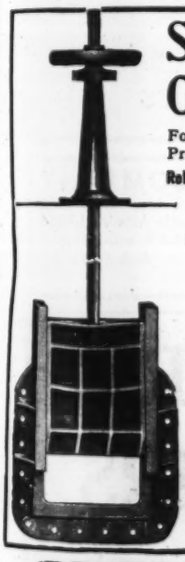
(Licensed Under JEWELL Patents)

AMERICAN PIPE AND CONSTRUCTION CO.

Water Works Engineers and Contractors
112 North Broad Street, Philadelphia

Also Manufacture
Welded Wrought Iron Pipe, Lined and Covered with Pure Cement and Having Lead Caulked Bell and Spigot Joints.
The only noncorrosive pipe on the market good for any pressure.

PITTSBURGH FILTER MANUFACTURING CO., Pittsburgh, Pa.
Contractors for Municipal and Industrial Filters, Water Softeners and Sewage Disposal Plants
Licensed Under Fundamental Negative Head Patents



SLUICE GATES

For High and Low Pressure Service
Roller Bearing
Hoisting Standards
Manhole Frames and Covers
Drain Frame Gratings
Expansion Joints Flexible Joints, etc. for Water Works Systems

COLDWELL-WILCOX CO.
NEWBURGH, N. Y.

Ross Regulator Valve
For Steam and Water

Will control the flow and maintain any desired pressure. For car heating it has no equal. No complicated parts. It is easily understood. It is durable, low in price, and always reliable. Made in sizes from 1 to 24 inches.

ROSS VALVE MFG. CO.
TROY, N. Y.

METERS

For WATER AND OIL

American and New Niagara with
Jewel Bearing Intermediate Gears
BUFFALO METER CO.
290 Terrace BUFFALO, N. Y.
Established 1892

FLEXIBLE JOINTS—

For Water-Pipes, Gas, Oil, Compressed Air, etc.

Strongest, Cheapest, Easiest to Use.
Contracts taken for Submerged Pipe-Laying.
CORRESPONDENCE SOLICITED.
A. L. HOLMES, - Grand Rapids, Mich.

PLAIN LETTERING

By PROF. HENRY S. JACOBY

Most comprehensive book on this subject. Contains standards of U. S. Engineer Corps, U. S. Geological and Geodetic Surveys, and Mississippi River Commission.

Cloth, 10 x 7 inches: 82 pages. Price $3.00.

The Cook Well Co.

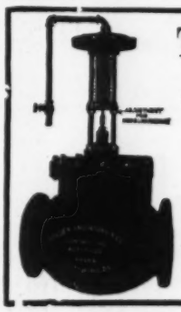
ST. LOUIS, MO., U. S. A.

COOK'S SYSTEM OF WELLS
For Cities, Towns, Villages, Railroads, Ice Plants, Breweries, and Manufactories

Cook's Patent Brass Tube Well Strainer

Cook's Deep Well Pumping Engines

Estimates Furnished Upon Application.
Write for Catalogue and Prices.



The Controlling Altitude Valve

automatically maintains uniform stage of water in tanks, reservoirs and standpipes
No Overflowing in Case of Fire Pressure
Valves Closed by WATER AND ELECTRICITY

The Heaviest Line of
AUTOMATIC VALVES KNOWN
Water Reducing Valves. Electrically Operated Valves. Automatic Float Valves. Standpipe Valves.

GOLDEN-ANDERSON VALVE SPECIALTY CO.
1002 Fulton Building, Pittsburg, Pa.

HIGH PRESSURE VALVES

Indorsed by some of the largest valve users in the United States.

Monarch Valve & Mfg. Co.
Springfield, Mass.

Factory: Warren, Mass. New York Office: 39 Cortlandt St.

We Make

HEAVY WATERWORKS VALVES

that have a reputation built up by years of satisfactory service, and they have proven reliable under all conditions. Our valves appeal to those seeking the best quality, design and workmanship. We will be glad to go into details—to give facts and figures—if you will write us. We make valves for every service.

Our Catalog Shows Every Style

The Kennedy Valve Mfg. Co., Elmira, N. Y.

Safeguard property from bursting mains by the use of

HYDRAULIC MOTORS

Keeps large valves in perfect operating condition.

30" and 36" valves opened or closed in three to five minutes. Operated by one man. Can be placed in a vault with the valve or carried on a repair wagon. Eliminates chance of damage ordinarily due to the bursting of mains. Get one. Test it. Ask for prices.

Ask also about our WATER METER TESTER.

THE A. P. SMITH MFG. CO., Newark, N. J.

The Bourbon Copper and Brass Works Company
MANUFACTURERS OF
FIRE HYDRANTS and STOP VALVES
Water Works and Fire Department Supplies and Extension Valve Boxes
Long Distance Phone, Canal 3297. 818 and 820 E. Front St., Cincinnati, O.

CAUSE AND EFFECT

First Quality Material
Highest Grade Workmanship
Unequalled Manufacturing Facilities
Forty Years' Experience

are responsible for

CROWN, EMPIRE, NASH,
GEM, PREMIER

WATER METERS

retaining their

PRE-EMINENT POSITION

NATIONAL METER COMPANY
84 CHAMBERS ST., NEW YORK
CHICAGO BOSTON CINCINNATI PITTSBURG LOS ANGELES

Water Meters

Keystone
and
Eureka

WATER METER CATALOG 107 FREE

Pittsburg Meter Co.
GENERAL OFFICES AND WORKS:
EAST PITTSBURG, PA.

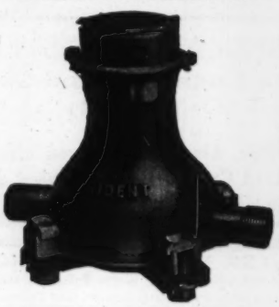
NEW YORK 149 Broadway | CHICAGO 256 Madison St. | KANSAS CITY 6 W. 10th St. | SEATTLE 8th & Madison Sts. | SAN FRANCISCO 149 New Montgomery St.

MANUFACTURERS OF WATER METERS AND GAS METERS

NEPTUNE METER CO.

MANUFACTURERS OF

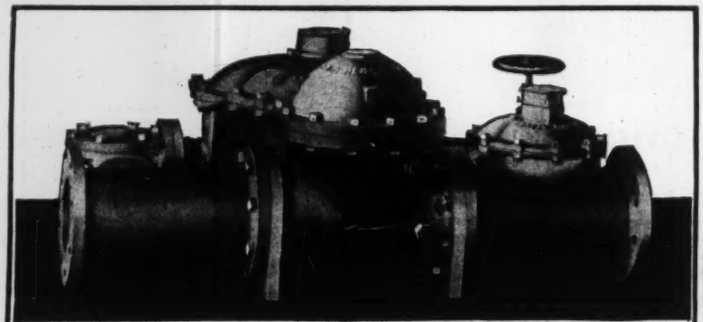
The well-known **Trident**



Frost-proof **Water Meters**

WRITE FOR CATALOG

NEW YORK CHICAGO BOSTON
ATLANTA LOS ANGELES



STOP WHOLESALE LOSS

Use the Hersey Detector-Meter on Fire and Manufacturing Services

Endorsed by Water Departments and Underwriters

This is the Only Meter
Which Registers All Large Flows
Which Registers All Small Flows
Which Does Not Obstruct the Flow

Send for Catalog and Booklet entitled
"The Hersey Detector-Meter and What Water Works Officials Say About It"

HERSEY MANUFACTURING COMPANY

Main Office and Works: South Boston, Mass.

714 Tremont Temple, Boston, Mass.
84 La Salle St., Chicago, Ill.
211 Schultz Bldg., Columbus, O.
174 Fulton St., New York, N. Y.
806 White Bldg., Buffalo, N. Y.
201 Kiser Bldg., Atlanta, Ga.

"ALL KINDS OF METERS FOR ALL KINDS OF SERVICES"
400,000 SOLD

SIMPLEX VALVE AND METER COMPANY

Manufacturers of
WATER METERS for large pipes, Rate Controllers, Automatic AIR VALVES, REGULATING VALVES and HYDRAULIC APPARATUS of Special Design.
112 North Broad St., ... Philadelphia, Pa.
See large advertisement in first issue of each month.

"LAMBERT" METERS

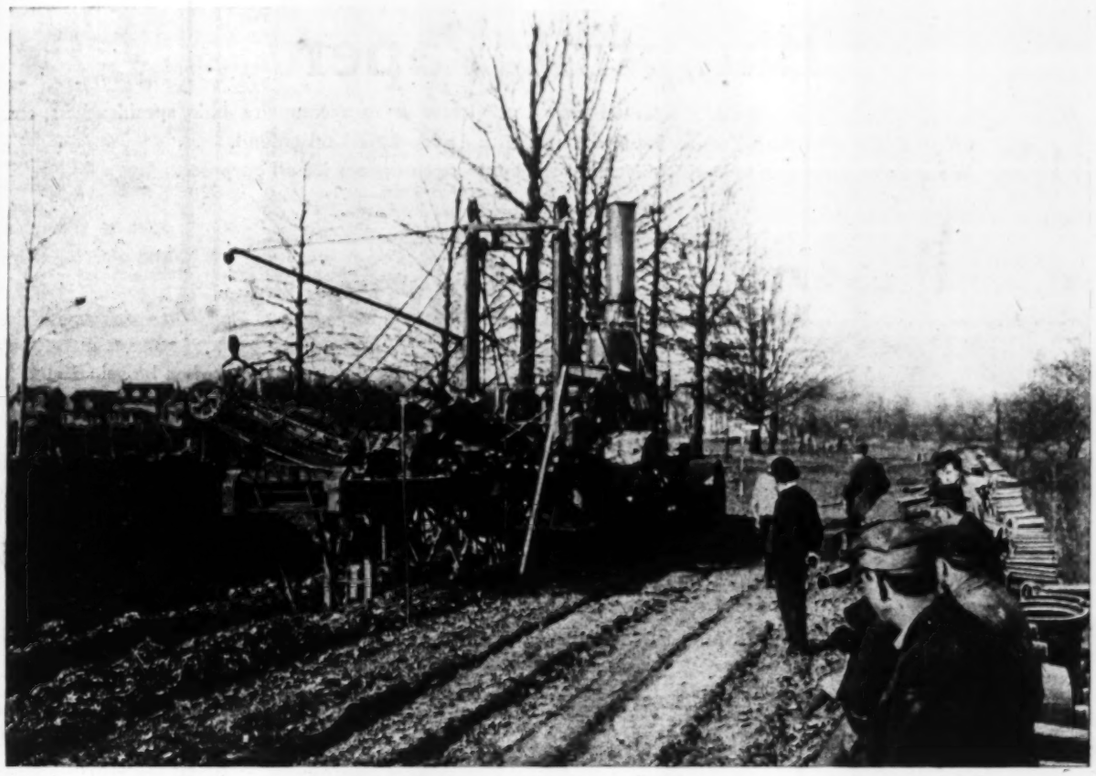
Made in all sizes from five-eighths to six inch of best bronze composition. Fitted with our unbreakable "Disc" of hard rubber reinforced with a steel plate.

The "Lambert" water meter has made meter systems popular.

THOMSON METER CO.

100-110 BRIDGE STREET BROOKLYN, N. Y.

Sanitary



Buckeye Traction Ditcher in Operation—Sanitary Sewer Work, Rocky River, Ohio

This scene is a familiar one to Engineers and Contractors. The usual self-appointed Prominent Citizens Committee are in attendance. They have approved the material, which is

Vitrified Salt-Glazed Sanitary Sewer Pipe

Everybody knows that it is the best and only Sanitary material for their sewer.

Western Clay Products Publicity Bureau

813 Wall Street Kansas City, Mo.

Drawing Paper

Duplex

Drawing Paper in cream and buff color permits of frequent handling without soiling, is agreeable to the eye and is not affected by frequent erasing. This paper is the result of 40 years' study of papers best adapted for drafting and is warranted to be uniform in quality.

Book of paper samples sent on request.

Blueprint Paper

Helios

Blueprint Paper is especially adapted for record prints or to accompany bids, specifications, etc., as it is tough and gives a sharp, white line in contrast with a deep blue background.
We make a variety of blueprint, blackprint and brownprint paper for all purposes.

Send for Blueprint paper sample book.

Tracing Paper

Colonna

Tracing Paper is very tough and transparent. This excellent paper can often be substituted for tracing cloth. Makes fine photo prints and is furnished both in thin and medium weights.

Samples of Tracing Paper sent on request.

KEUFFEL & ESSER CO.

127 Fulton Street, NEW YORK — **General Office and Factories, HOBOKEN, N. J.**

CHICAGO, 111 E. Madison St. ST. LOUIS, 813 Locust St. SAN FRANCISCO, 48-50 Second St. MONTREAL, 252 Notre Dame St. W.

Drawing Materials — Mathematical and Surveying Instruments — Measuring Tapes

DRAFTING FURNITURE

Of every description—for use in Drafting Rooms, Factories, Schools, Etc. Shipped from stock or special equipment made to order. The lowest prices consistent with high grade material. *Send for Reference Catalog for your desk.*

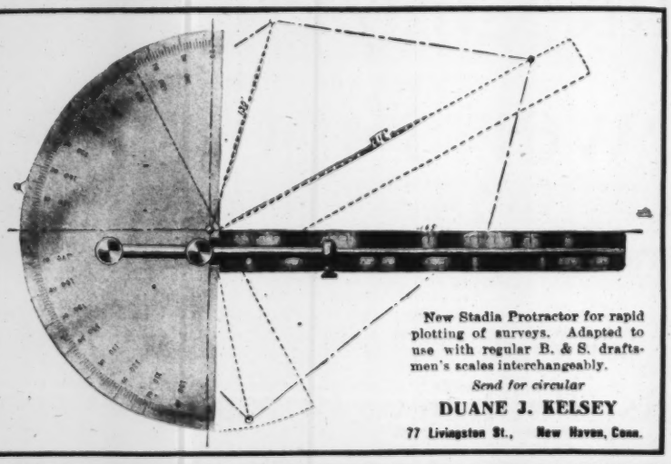
AMERICAN DRAFTING FURNITURE CO.
20-34 Railroad St. ROCHESTER, N. Y.

All the Comfort, Convenience, Practicability and Good Quality

Many Styles and Sizes — Catalog Free

that's contained in **Economy Drawing Cases and Tables,** will aid wonderfully in the smooth running and efficiency of your Drafting room. More room, better work, greater contentment, are the result. We make the best in this line. Our reputation forbids the making of cheap goods—ours are cheap only in the sense that they are genuinely Economical.

ECONOMY DRAWING TABLE CO., 850 Oak St., Toledo, O.



New Stadia Protractor for rapid plotting of surveys. Adapted to use with regular B. & S. draftsmen's scales interchangeably.

Send for circular

DUANE J. KELSEY
77 Livingston St., New Haven, Conn.

WE SUPPLY
BOOKS ON ANY SUBJECT
Engineering News Book Department

The Only Real Tape for Railroads and Surveyors

Chicago Steel Tape Co.'s Product

Carried by all leading supply houses

Send for Illustrated Circulars

6233 Cottage Grove Avenue CHICAGO, ILL.

TRANSITS AND LEVELS

Bausch & Lomb Optical Co.

NEW YORK WASHINGTON CHICAGO SAN FRANCISCO
LONDON ROCHESTER, N.Y. FRANKFORT

EVERY USER OF BLUE PRINTS
Should Investigate
The NEW "EXPRESS" SYSTEM of BLUE PRINTING

Automatic, saves one-half the cost. One boy does the work of 4 men. It makes Blue Prints, Black Prints and Brown Prints. Works Day or Night, makes prints any length. For users of Blue Print Paper we supply Coating Machines for making blue print paper or linen. **The Express System Saves Money. Let us explain.**

WILLIAMS, BROWN & EARLE, Inc.
Dept. G, 918 Chestnut St. PHILADELPHIA, PA.

BUFF

ENGINEERING INSTRUMENTS

Buff & Buff Company

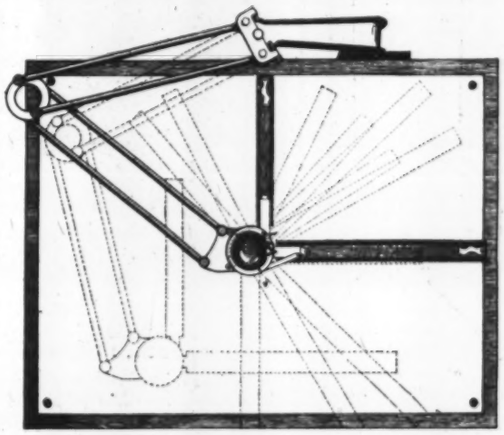
Jamaica Plain Station

BOSTON, MASS.

Send for Catalog 32

The "Buff" has no real competitors for quality or accuracy. The price is no more than that of several others.

Ball Bearing Tubular Rod Drafting Machine



Practically Ideal

This Universal Drafting Machine is our latest model and comes as close to perfection as human skill and ingenuity can produce. Among its special features are—Ball Bearing Joints, Tubular Rods, Every Working Part Adjustable, Parts Interchangeable, Interchangeable Protractors and Interchangeable Scales. Small space is required in which to operate the machine and large capacity is assured. It is a machine of extreme lightness, easy, sensitive motion and great rigidity.

Write for catalog and learn how drafting can be made quick and easy.

UNIVERSAL DRAFTING MACHINE CO., Cleveland, Ohio, U. S. A.

HOW DOES SOLTMANN 123 E. 42nd St. NEW YORK MAKE

"IN-KO-GRAF"

REDUCTIONS, ENLARGEMENTS AND SAME SIZE COPIES OF YOUR TRACINGS, IN BLACK LINES ON WHITE?

WRITE FOR SAMPLE STATE YOUR REQUIREMENTS

KEYSTONE

Blue Print Paper

Keystone Blue Paper Co.

910-912 Filbert Street

Philadelphia

IF YOU DON'T KNOW

"ULMER" QUALITY

Send for catalog—"E"—of highest grade instruments. Know why "ULMER" quality is better quality. Our years of experience, better facilities, expert workmen, best of material and modern methods enable us to give you more accurate instruments that are guaranteed to last a lifetime and cost you no more than the inferior kind.

THE J. C. ULMER CO.

112 PROSPECT AVENUE N. W. - - - CLEVELAND, O.

YOUR PROPOSAL NOTICES IN ENGINEERING NEWS

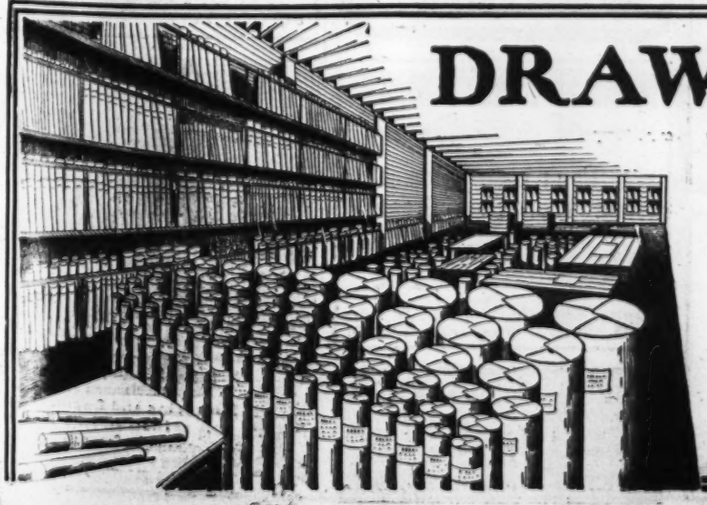
Reach the Largest Circulation in the Civil Engineering and Contracting Field

Architects & Engineers' Supply Co.

DRAWING & SURVEYORS INSTRUMENTS

ARTISTS MATERIALS, BLUE PRINTS & REPAIRING

1010 GRAND AVE. KANSAS CITY, MO.



DRAWING PAPERS

Our **"CECIL"** is pre-eminently the best buff detail drawing paper made. Price is low considering the high quality.

Our **"ALTON"** is a good buff detail drawing paper at a low price. Well suited for mechanical work.

Our **"IRON CITY"** is a splendid cheap detail paper for use of Architects, Bridge Companies, etc. It is carried in three different weights.

Ask for Sample Book "E" showing our big line.

B. K. ELLIOTT CO.

Manufacturers and Importers

108 Sixth Street PITTSBURGH

"Tycos" Recording Thermometers Tell The Truth

Practical, Reliable Instruments embodying several entirely new features. Even Spacing of Chart. Practically Indestructible Capillary. Greater Strength of Movement. Ask us for folder explaining advantages.

The Hohmann & Maurer Division
Taylor Instrument Companies ROCHESTER, N. Y.
"Where the Thermometers Come From"
NEW YORK BOSTON CHICAGO

STANDARD No. 6 TRANSIT
4½-inch Needle.
6½-inch Graduations, reading minutes.
Telescope of high power and large field, with level, clamp and opposing screws and vertical arc.
Non-working Parts of Aluminum Alloy.
Patented Ball-Bearing Centres.
Price, $225.00
Telegraph and Code Word, SPRUCE

"It's a Young" will satisfy any possible doubts regarding the accuracy of the readings of your instrument.

Illustrated Catalogue upon application

YOUNG & SONS
PHILADELPHIA

The Putman Boots
The World's Standard.

Putman Boots are the oldest and best known boots on the market. They are the best, because they are made by expert boot makers, in the only factory in the U. S. devoted exclusively to boot making. They are worn in nearly every civilized country and have earned the name of "The World's Standard."

Our free catalogue describes over 30 styles of boots adapted to the demands of Civil and Mining Engineers, Prospectors, Sportsmen, etc. We can furnish you with practical boots for your kind of work, and at a variety of prices. PUTMAN BOOTS are hand sewed, waterproofed. Made to measure, cost no more than others, and delivery charges are prepaid in U. S., Canada or Mexico. Send for Catalogue and Self Measuring Blanks.

H. J. PUTMAN & CO., 38 Bridge Square, Minneapolis, Minn.

Berger
TRANSITS AND LEVELS

Are made to last with hard treatment in rough country work, but every movement works with utmost precision, giving rapid and at once true results.

C. L. BERGER & SONS, Boston, Mass., U. S. A.
Illustrated Catalog Free. Order Instruments by code in back of Catalog.

QUEEN Transits and Levels

For 50 Years the Standard
Used Throughout the World

Illustrated catalogue of Engineers' and Draftsmen's Instruments and Field and Office supplies. Free on application.

QUEEN & CO., Inc.
1211-1217 Arch Street PHILADELPHIA

BUFF
ENGINEERING INSTRUMENTS

Buff & Buff Company
Jamaica Plain Station
BOSTON, MASS.
Send for Catalog 82

The "Buff" is made by a family of actual instrument experts, who, even our competitors admit, "stand at the head."

IF You Use Drawing Inst's
WE WILL SEND FREE

Our Illustrated Catalogue of Profile, Tracing, Blue Print Papers, Squares, Triangles, Scales and all Draughting Room Furniture, Materials and Supplies. Write for same.

Aloe's Engineer's Transit
$185 NEW MODEL $185

Designed for high class engineering work. Includes Lens and Clamp and Tangent, with five-inch vertical arc with vernier reading to single minutes, graduations on Silvered Brass, in box with Tripod, Plumb Bob, Sunshade, Magnifier, Screw driver and Adjusting Pins. Weight with Tripod complete about 20 pounds.

OUR GUARANTEE
Your Money Back If Wanted

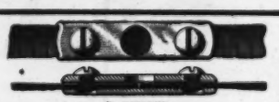
Established 1860
A. S. ALOE CO.
510 Olive St. St. Louis, Mo.

Lietz Transits and Levels
Are Foremost with the Profession

When interested in High Grade Instruments of Precision, which constitute labor saving devices, do not hesitate to consult a Pacific Coast establishment, where the art of producing same has reached great efficiency under personal supervision of our Mr. Lietz for the last 28 years.

THE A. LIETZ CO., San Francisco, Cal.

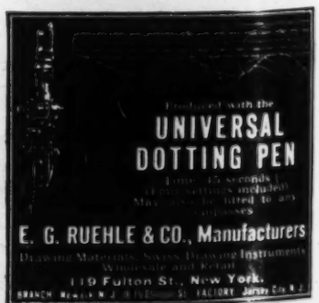
THE A. LIETZ CO., San Francisco, Cal. Ithaca, N. Y., May 9, 1907.
Gentlemen:—* * * * will say that the Transit purchased of you last year appears to be of first class workmanship. It has given entire satisfaction, and is placed among our best instruments. Very respectfully,
C. L. CRANDALL, College of Civil Engineering, Cornell University.



PATENTED
Don't Lose Time When Your Tape Breaks!

Use the "Little Giant" Tape Splice. Will repair a broken tape in a minute. Attach with a knife blade. For temporary or permanent repair. Postpaid, $4.00 per dozen, 3 for $1.00. Give width of tape.

Alpha Engineering Co., M'f'rs.
P. O. Box 69, Washington, D. C.



UNIVERSAL DOTTING PEN
E. G. RUEHLE & CO., Manufacturers
119 Fulton St., New York.

The Reason the Luther Hand-Made Glove will not Rip

Machine sewing cuts itself Hand sewing cannot

A PRACTICAL FIELD GLOVE

Made for practical, comfortable durability. No oil. No odor. No animal glue. Practically seamless. Cannot rip. Unaffected by moisture of any kind. If soiled, may be washed with soap and hot water, without injury. The Leather Fastener is adjustable, fits any wrist and cannot get out of order. Illustrated booklet, samples and self-measurement rule on application. If you prefer to buy through your dealer send us his name.

No. 370, Gauntlet, - $3.00; made to measure, $3.50
No. 366, Driving Glove, - 2.00; " 2.50
Postpaid Anywhere

J. P. LUTHER GLOVE CO., 529 Pearl St., Berlin, Wis.

HERM. PFISTER
Manufacturer of
Surveying and Engineering Instruments
Send for Catalogue
All kinds of repairing promptly done
436 Plum St., Cincinnati, O.

"KOH-I-NOOR"
THE PERFECT PENCIL
MADE IN AUSTRIA

FOR ENGINEERS AND DRAFTSMEN

ALL DEGREES OF HARDNESS

FOR SALE BY ALL DEALERS IN ARCHITECTS & DRAFTSMENS SUPPLIES

L. & C. HARDTMUTH
MANUFACTURERS
34 EAST 23RD STREET, NEW YORK
FACTORIES BUDWEIS, AUSTRIA.

READY JANUARY 1st

Ainsworth's 1911 Manual

For ENGINEERS and SURVEYORS

CONTENTS

Adjustment and Care of Instruments.
Determination of Meridian by Solar and Star Observations.
Stadia Surveying.
Trigonometrical Formulas.
Mensuration.
Public Surveys.
Ephemeris Tables.
Declination Tables.
Stadia Reduction Tables.

Not a catalog, but a

100 Page Leather Bound Pocket Manual

that is indispensable to the man in the field.

PRICE, 25 CENTS POSTPAID
(About half the cost of publication.)

Limited edition. First come, first served

Sent on approval upon receipt of postcard giving your permanent address and mention this publication.

WM. AINSWORTH & SONS · THE PRECISION FACTORY · DENVER, COLO. U.S.A.

ACCURATE RECORDING

TEMPERATURE
PRESSURE
VACUUM
ELECTRICITY

WATER-LEVEL
SPEED
METEOROLOGY
AERONAUTICS

INSTRUMENTS

ERNEST H. DU VIVIER
40 CHURCH ST. NEW YORK CITY

F. WEBER & CO.

St. Louis Philadelphia Baltimore

ENGINEERING INSTRUMENTS

DRAFTSMEN'S and ENGINEERS' SUPPLIES

The IMPROVED HALDEN CALCULEX
The most perfect acting of all circular slide rules. Price on application.

Second-hand Transits, Levels Bought, Sold or Exchanged

Repairing Neatly Done
Send for Catalogue

P. & R. WITTSTOCK

BERLIN, S. 59, GERMANY

Manufacturers of Modern Instruments of Precision for Engineering, Surveying, Mining. Most improved constructions. Highest quality. Moderate prices.

Send for our Price List

JOHNSTON'S IMPROVED REELS and TAPES

Price of Reel $15.00
Price of 310 ft. Tape 15.00
Combination as above 25.00

Descriptive booklet on request
Manufactured and sold only by
ROBERT JOHNSTON
12 North Main Street
Wilkes-Barre, Pa.

BUFF

ENGINEERING INSTRUMENTS

Buff & Buff Company
Jamaica Plain Station
BOSTON, MASS.

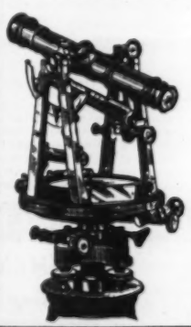
Send for Catalogue 33

The "Buff" builds the best railroads, the largest government works, the deepest mines.

ESTABLISHED 1845
W. & L. E. GURLEY
TROY, N. Y.

Branch Factory: Seattle, Wash.
Largest Manufacturers in America of
Civil Engineers' and Surveyors' Instruments
Also Dealers in
Drawing Materials and Scientific Books
Latest Catalogue on Application

EXPERT REPAIR WORK ON
TRANSITS AND LEVELS



We maintain a Corps of expert Instrument Makers on **Repair Work Exclusively.**

Let us demonstrate our ability to repair any Instrument made in the shortest time and at a saving in cost.

ISZARD-WARREN CO., Inc.
SURVEYING INSTRUMENT MAKERS
136 No. 12th Street, Philadelphia, U. S. A.

LUFKIN
MEASURING TAPES

are distinguishable by their characteristic features of superior design and workmanship. They are remembered by their accuracy and serviceability under all conditions.

THE LUFKIN RULE CO. SAGINAW, MICH., U. S. A. New York London, Can.

Engineers' Improved Transit with Bubble To Telescope and Vertical Circle

a transit that meets all requirements. Thorough construction. Selected lenses. Powerful achromatic terrestrial telescope about 11 in. long.

Full description given in catalog—ask for a copy.

KOLESCH & COMPANY
Established 1885
138 Fulton Street NEW YORK

—Engineering :: Schools :: and :: Colleges—

Sheffield Scientific School of Yale

UNIVERSITY. Courses in Civil, Mechanical, Sanitary and Electrical Engineering; in Chemistry—Pure and Applied; in Botany, Zoology, Mineralogy, and Geology; in studies preparatory to Mining and Metallurgy; in Biology, especially as preparation for a Medical Course; and in General Scientific Studies, with English, French, Spanish and German. Political Economy, History, etc.

RUSSELL H. CHITTENDEN, Director, New Haven, Conn.

Pennsylvania Military College, CHESTER PA.

48th Year, Beginning September 15th, 1900.

Degrees in Civil Engineering, Chemistry, Arts; also thorough Preparatory Courses of Study are offered, together with the physical benefits, the moral stamina, the healthful diversion, and training in personal efficiency—supplied by a military school of the best type.

Catalogues of Col. C. E. HYATT, President.

University of Vermont.

DEPARTMENT OF ENGINEERING

Thorough courses are offered in Civil, Mechanical and Electrical Engineering. Modern equipment of Shops and Laboratories.

For Catalogues or Department Bulletins address,

J. W. VOTEY, Dean, Burlington, Vt.

University of Illinois.

Full courses in Architecture, Civil, Electrical, Mechanical, Municipal and Railway Engineering. Also in Literature, Science, Agriculture, Medicine, Pharmacy, Dentistry. Excellent instruction, buildings, laboratories, shops and equipment.

For catalogue or information, address,

REGISTRAR, Champaign or Urbana, Ill.

Iowa State College, AMES, IOWA.

Four years' courses in CIVIL, MECHANICAL, ELECTRICAL and MINING ENGINEERING, and seven courses in GENERAL SCIENCE, AGRICULTURE, and VETERINARY MEDICINE. Extensive shops and laboratory equipment, and a $220,000 new Engineering Hall. 116 instructors, over 700 engineering students. Tuition, $50 per year. Free to Iowa students. For further information address,

A. B. STORMS, President.

Michigan College of Mines

F. W. McNair, President

Located in Lake Superior district. Mines and mills accessible for college work.

For Year Book and Record of Graduates apply to President or Secretary

HOUGHTON, MICHIGAN.

New York University School of Applied Science

Departments of Civil, Mechanical and Chemical Engineering.

For announcements or other information, address,

CHARLES HENRY SNOW, Dean, University Heights, N. Y. City.

The Rensselaer Polytechnic Institute

TROY, N. Y.

ENGINEERING AND SCIENCE

Courses in Civil Engineering (C. E.), Mechanical Engineering (M. E.), Electrical Engineering (E. E.) and General Science (B. S.). Also Special Courses.

Unsurpassed new Chemical, Physical, Electrical, Mechanical and Materials Testing Laboratories.

For catalogue and illustrated pamphlets showing work of graduates and students and views of buildings and campus apply to the

REGISTRAR OF THE INSTITUTE.

Tufts College,

DEPARTMENT OF ENGINEERING.

Courses in Civil, Mechanical, Electrical and Chemical Engineering. Excellent shop and laboratory equipment.

For catalogue and information, address,

Prof. GARDNER C. ANTHONY, Dean, Tufts College, Mass.

Worcester Polytechnic Institute,

WORCESTER, MASSACHUSETTS. A SCHOOL OF ENGINEERING.

Mechanical, Civil, Electrical, Chemical Engineering, and General Science. Extensive Laboratories in Mechanical Engineering, Steam Engineering, Hydraulic Engineering, Physics, General Chemistry, Industrial Chemistry. Well equipped Shops for Moulding, Forging, Machine Construction. Pattern Making. Catalogue mailed on request.

J. K. MARSHALL, Registrar.

Rose Polytechnic Institute,

TERRE HAUTE, IND.

Courses in Mechanical, Electrical, and Civil Engineering, Architecture and Chemistry. Extensive shops. Completely Equipped Laboratories in all Departments. Expenses low.

For catalogue or special information, address,

C. L. MEES, President.

Clarkson School of Technology.

Potsdam, N. Y.

Organized under charter of the University of the State of New York. Courses leading to degrees of the University of Bachelor of Science in Chemical, Civil, Electrical, Mechanical Engineering.

Four years of thorough training and resident college work.

The Clarkson Bulletin, published quarterly, mailed on application. WM. S. ALDRICH, Director.

Montana State School of Mines,

BUTTE, MONTANA.

Located in a Great Mining District.

Thorough course of four years in Mining and Metallurgy equips young men for immediate service in Mines and Reduction Works.

For information address Registrar.

Lewis Institute, CHICAGO, ILL.

Four year course leading to degree of Bachelor of Science in Mechanical Engineering. While the course is planned with special reference to mechanical engineering, much time is devoted to electrical work, and such attention is given to engineering chemistry, civil engineering, and general subjects as to graduate men with broad fundamental training along engineering lines. Catalogue on application.

Armour Institute of Technology,

CHICAGO, ILLINOIS.

Courses in Electrical, Mechanical, Civil, Chemical and Fire Protection Engineering and Architecture. Completely equipped laboratories in all departments.

Year-book sent on application.

Northwestern University Evanston, Ill.

COLLEGE OF ENGINEERING

With all the advantages of a new and small college. Offers a thorough professional course in engineering five years in length with the emphasis placed strongly on the fundamentals. An unusually large ratio of professors to students in the purely engineering part of the course.

JOHN F. HAYFORD, Director.

Established 1870

HELLER & BRIGHTLY

MANUFACTURERS OF

Engineering, Mining and Surveying INSTRUMENTS

Catalogue on Application

Cor. Spring Garden St. and Ridge Ave. Philadelphia, Pa.

—Testing :: Laboratories—

THE AMERICAN BUREAU OF INSPECTION AND TESTS.

Morgan T. Jones, Insp. Engineer.
G. W. Greene, M. E. J. A. Foulks, C. E.
E. B. Wilson, M. Am. Soc. C. E.

Inspection of Rails, Cars, Locomotives, Bridges, Building Materials, Cement Testing. Chemical and Physical Laboratories.

Monadnock Block, CHICAGO.
312 Wabash Building, PITTSBURG.
29 Broadway, NEW YORK.

BOOTH, GARRETT & BLAIR,

Chemists and Engineers.
Established 1836.

Chemical Analyses of Ores, Water, Minerals, Metals and Manufactured Products. Tests of Paving Bricks, Crushing, Abrasion, Absorption Tests, Tests of Cement and Cement-Making Materials. Land Investigation.

404 & 406 Locust St., PHILADELPHIA, PA.

WILLIAM R. CONARD,

Assoc. Am. Soc. C. E. Assoc. M., Am. Soc. M. E.

Inspection of Rails, Bridge Materials, Building Materials of Iron and Steel, Cars, Locomotives, etc.

Specialty: Inspection of all Water-Works Materials, 322 High St., BURLINGTON, N. J.

ELECTRICAL TESTING AND RESEARCH LABORATORY.

Facilities for investigating any branch of the electrical industry. Designs, Reports, Specifications, etc.

E. S. LINCOLN, Consulting Engineer, BROOKLINE, MASS.

THE EMERSON LABORATORY,

Chemists.
Specialists in water analyses, Sanitary and Industrial.
Every facility for bacteriological examinations.
177 State St., Springfield, Mass.

GULICK-HENDERSON CO.

Inspecting Engineers, Inspection of Bridges, Building Materials, Railway Equipment, Cement Pipe, Machinery, etc. Examinations, Consultations, Appraisements, Chemists, Merallurgists. General Offices: 439 3d Ave., PITTSBURG; Manhattan Bldg., CHICAGO, ILL.: 30 Church St., NEW YORK.

HILDRETH & CO.,

Consulting and Inspecting Engineers.
Philadelphia, Pittsburg, Chicago,
135 Broadway, NEW YORK.

ROBERT W. HUNT & CO.,

Bureau of Inspection, Tests and C[illegible]ation.
Robert W. Hunt,
Jno. J. Cone,
A. W. Fiero,
Jas. C. Hallsted,
D. W. McNaugher.

Inspection of Rails and Fasten[illegible] Cars, Locomotives, Pipe, etc. Bridges[illegible]dings and other Structures.

Chemical and Physical Labora[illegible]
Reports and Estimates on Pro[illegible]s and Processes.

1121 The Rookery, [illegible]AGO.
90 West St., NE[illegible] YORK.
Monongahela Bank Bldg., PI[illegible]BURG.
14425 Syndicate Trust Bldg., [illegible] LOUIS.
425 Washington St., SAN F[illegible]CISCO.
81 Norfolk House, Cannon [illegible]
LON[illegible] ENG.

LEHIGH VALLEY TESTING LABO[illegible]TORY.

Cement Testing and INSPECT[illegible] at the mills before shipme[illegible]
Chemical Analyses, Physi[illegible]esting.
PITTSBURG, PA. ALLE[illegible]WN, PA.

PITTSBURGH TESTING LABORATORY,

ENGINEERS and CHEMISTS.

Inspection of Rails, Cars, Bridges and Buildings, Pipe, Boilers, Engine[illegible]etc.; Cement Testing and Inspection at Mills before Shipment. Chemical and Physical Tests, Consultation and Reports.

PITTSBURGH—CHICAGO—NEW YORK.

UNDERWRITERS' LABORATORIES, INC.

Under the Direction of the National Board of Fire Underwriters.
207 East Ohio Street, CHICAGO, ILL.
W. H. Merrill, Manager.

Branch Offices.

New York	Buffalo	St. Paul, Minn.
Boston	Montreal	Memphis
Philadelphia	Toronto	Milwaukee
Pittsburg	Syracuse	Bridgeport, Conn.
St. Louis	Atlanta, Ga.	Elmira, N. Y.
San Francisco	New Orleans	Dallas, Texas
Columbus, Ohio	Detroit	Louisville
Cincinnati	Kansas City	Denver
Cleveland, Ohio	Indianapolis	Omaha, Neb.
Baltimore, Md.	Minneapolis	Topeka, Kan.

WE SUPPLY
BOOKS ON ANY SUBJECT
Engineering News Book Department

Please Mention ENGINEERING NEWS

MACDONALD & MACDONALD
COUNSELORS IN PATENT CAUSES
SOLICITORS OF PATENTS
Hudson Terminal Building, 50 Church St., NEW YORK

Please Mention ENGINEERING NEWS When Writing Advertisers

ELECTROLYSIS INVESTIGATIONS

Consulting Engineers
Mechanical Electrical Civil
Investigations, Reports, Estimates, Cost Analyses, Supervision and Construction
SPECIALISTS IN ELECTROLYSIS SURVEYS
THE LEHIGH ENGINEERING-CONTRACTING COMPANY
Real Estate Trust Building Philadelphia, Pa.

Have You the Most Competent Help?
If not, try our "Want" pages, for immediate results. Three cents a word.

RUBBERHIDE

Made from the highest grade materials throughout. Has stood the test for eight years and is recognized as the standard Leather Soled Rubber Boot.

Used by miners and contractors in the United States, Canada, Mexico, South America, Australia, and New Zealand

Write for Catalog and Prices

Rubberhide Company, Dept N. Boston, Mass.

Tables of Squares By John L. Hall

SECOND EDITION

to which has been added the squares of each $\frac{1}{16}$ of an inch to a point where direct interpolation will suffice.

Invaluable for Engineers and Calculators

This book contains the true square of every foot, inch and sixteenth of an inch between one-sixteenth of an inch and 100 feet.

The page numbers agree with the number of feet to be squared; a separate column is devoted to each inch, broken by blanks into quarters, and the roots are set in heavy type, thus securing the utmost ease of reference and clearness.

Flexible Morocco; Oblong; 5¼x3½ ins.; gilt edges. PRICE, $2.00

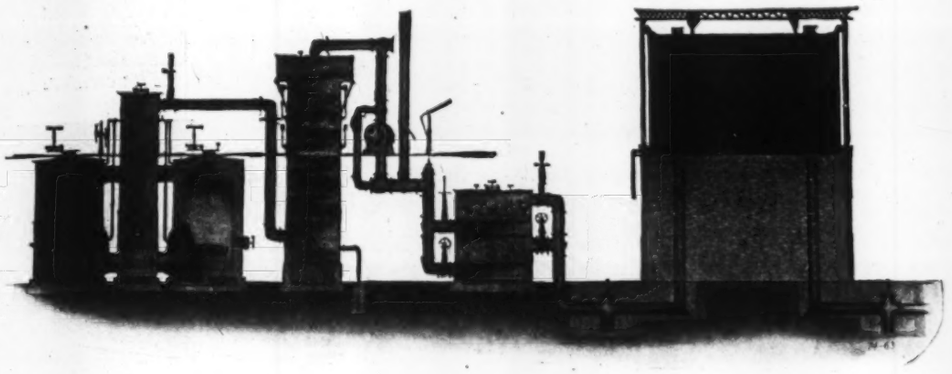
The Engineering News Book Department
220 Broadway, New York

Write to us for Books on any subject in which you are interested

Power & Mining Machinery Co.

CUDAHY, (SUBURB OF MILWAUKEE) WIS., U.S.A.

District Offices: New York, Chicago, Atlanta, El Paso, San Francisco



GAS FOR POWER

THE Loomis-Pettibone Gas Generating System produces a clean, fixed gas absolutely free from tar.

The fire is always in sight of the operator, permitting an even distribution of fuel—no poking is required.

The patented down draught system keeps charging floor cool and free from noxious gases.

Lowest operating and maintenance cost—combined with highest efficiency—200,000 horse power now in successful operation. Correspondence invited.

PRINCIPAL PRODUCTS: ROCK CRUSHING MACHINERY—MINING AND SMELTING MACHINERY—CEMENT-MAKING MACHINERY—WOOD IMPREGNATING PLANTS—POWER TRANSMITTING MACHINERY—LOOMIS-PETTIBONE GAS GENERATORS—SUCTION GAS PRODUCERS.

WESTERN SALES OFFICES: United Iron Works, Spokane, Wash.; Moran Engineering Co., Seattle, Wash.

74-2072

STOW FLEXIBLE SHAFT

Invented and Mfd. by

THE STOW MFG. CO.

Est. 1875. BINGHAMTON, N.Y.

PORTABLE DRILLING TAPPING REAMING

General European Agents SELIG, SONNENTHAL & Co.

85 Queen Victoria Street, London, Eng.

WE DRILL ARTESIAN WELLS

From 100 to 1500 feet deep—any locality

AND ERECT

Wooden Tanks, Windmills and Steel Structures

AND INSTALL

Complete Water Supply Plants for Factories Farms or Suburban Homes

Stothoff Bros., Flemington, N. J.

Branch Office: 16 Murray St., New York City

General Agents for Challenge Co.'s Windmills, Tanks and Structures manufactured at Batavia, Ill. Wholesale and Retail.

Chester B. Albree Iron Works Co.

Allegheny, Pennsylvania

MANUFACTURERS

RIVETERS

For Boiler, Bridge, Tank Work, etc.

Send for Catalogues

Well Drilling Machines

Over 70 sizes and styles, for drilling either deep or shallow wells in any kind of soil or rock. Mounted on wheels or on sills. With engines or horse powers. Strong, simple, durable. Any mechanic can operate them. Send for catalog.

WILLIAMS BROS., ITHACA, N. Y.

COLE BROTHERS

CONTRACTORS FOR

Artesian Wells & Water Supply

Wells Sunk in Earth or Rock any Depth
Test Borings for Water or Foundations

108 Fulton St. :: New York

TROJAN POWDER

THE SUCCESSOR TO NITROGLYCERIN DYNAMITE

has no liquid base and cannot freeze, will not explode from ordinary impact or jar, generates no injurious gases from combustion, and stick for stick does the work of Nitroglycerin Dynamite at a lower cost.

Investigation courted.

TROJAN POWDER COMPANY

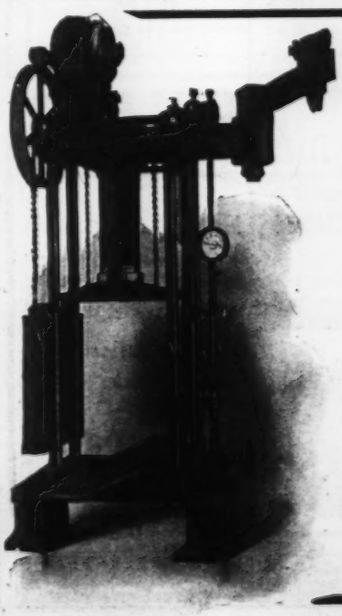
[INDEPENDENT]

NEW YORK, 65 Pine St. CHICAGO, Chamber of Commerce Bldg. SAN FRANCISCO, Phelan Bldg. SALT LAKE CITY, Dooly Block. PORTLAND, ORE., Henry Bldg. ALLENTOWN, PA., Allentown National Bank Bldg.

If you cannot locate the manufacturer of the equipment you desire, write to our

"READERS' WANT DEPARTMENT"

and we will be glad to put you in touch with the proper party without cost.



You would like this Watson-Stillman Forcing Press

THE crane bracket and beam at the right permit the work to be picked up from a truck, swung onto either bracket shelf and onto the platen with little exertion or loss of time. The shelves, being removable, can be taken off for jobs where they would be in the way.

This press is made with 18 inch by 24 inch platens and for 60 or 100 tons pressure. If neither size fits your work we have numerous other types and sizes up to 4000 tons from which to select one that will. Tell us where you expect to use a hydraulic press and we will advise you to your best interests.

WATSON-STILLMAN CO.

50 Church Street, New York 51

"DA 21" Stoper

SMOOTH RUNNING SULLIVAN HAMMER DRILLS

will give you the most efficient service for mining, quarrying, or contracting work. The patented Sullivan Valve motion and exhaust control render these drills the fastest made, as well as the most economical of power and repairs, and **the easiest to handle.**

"DB 15" Contractor's Drills

ASK FOR SPECIAL BULLETINS

"DA 15" Plug Drills

No. 460-F. Hammer Drills for light rock excavation. No. 460-D. Stoping Drills.
No. 460-C. "Plug" Drills, Foot Hole Drills, Stone Dressing Tools

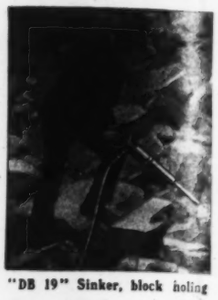
SULLIVAN MACHINERY CO.

Birmingham, Ala.
Butte, Mont.
Claremont, N. H.
Cobalt, Ont.
Denver, Colo.
El Paso
Joplin, Mo.

150 Michigan Avenue
CHICAGO, U.S.A.

Knoxville Nelson, B. C. New York

Pittsburg
Salt Lake
San Francisco
St. Louis
Seattle
Spokane
Sydney, Aust.



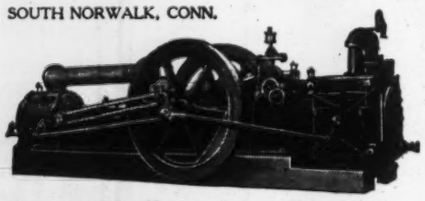
"DB 19" Sinker, block holing

THE NORWALK IRON WORKS CO.

SOUTH NORWALK, CONN.

MAKERS OF

Air and Gas Compressors



For Any Volume and For Any Pressure

Buy an "ALLEN" PORTABLE PNEUMATIC RIVETER

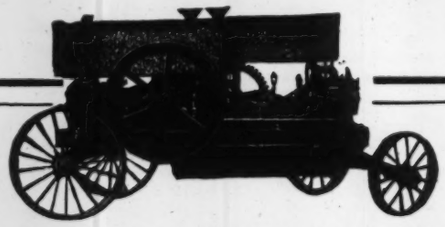
and be sure of the *fastest* and *tightest riveting* at the *lowest cost.*

Send for our unequalled "Records." They will interest you.

Special riveters designed to meet all requirements.

"WHATEVER THE RIVETING, THERE'S AN *ALLEN* FOR THE JOB."

JOHN F. ALLEN COMPANY
Estab. 1872
370-372 Gerard Ave., NEW YORK
Liebers and W. U. Codes "Riveter"



WRITE FOR CATALOG A2

PORTABLE — EFFICIENT

ABENAQUE GAS OR GASOLENE DRIVEN AIR COMPRESSOR OUTFITS

easily show their value to contractors in the use of air driven tools, or in any utilization of compressed air. A self-contained outfit complete in all respects. Highly efficient, and can be handled by inexperienced help.

ABENAQUE MACHINE WORKS, WESTMINSTER STATION VERMONT

BOSTON SALESROOM, 79 MILK ST., BOSTON, MASS.

DRILLS

ROCK—HAMMER—CORE

For all classes of work

AIR COMPRESSORS

In various sizes and types

For full information write

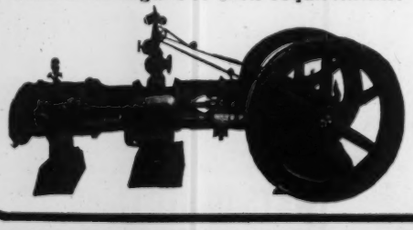
McKIERNAN-TERRY DRILL CO.
115 Broadway, NEW YORK

30 in. Core Drill

The Laidlaw-Dunn-Gordon Co.

AIR COMPRESSORS

The Laidlaw-Dunn-Gordon line of Air Compressors is most comprehensive and includes apparatus especially designed for every service. Prospective users are invited to correspond with us in regard to their requirements.



Main Office and Works

Cincinnati Ohio

"WOOD" ROCK DRILLS

Made by **Wood Drill Works,** Paterson, N. J.

that can be "Cleaned up with a Sledge Hammer" and "Wiped Off with a Scoop Shovel" and yet "Stay with You."

27 Coenties Slip New York City **HAROLD L. BOND CO.** 383 Atlantic Ave. Boston, Mass.

"PEERLESS" AIR COMPRESSORS

VACUUM PUMPS *Send for Catalogue*

American Compressor & Pump Co. 718 East Pratt St. Baltimore, Md.

AMERICAN AIR COMPRESSORS

CATALOGUE GRATIS SIMPLE DURABLE AUTOMATIC ECONOMIC FOR ALL PURPOSES

AMERICAN AIR COMPRESSOR WORKS, 26 CORTLANDT ST. NEW YORK

BURY COMPRESSOR CO., Erie, Pa., U. S. A.
AIR COMPRESSORS FOR ALL PURPOSES NOISELESS IN OPERATION

The Dudgeon "Universal"

has revolutionized the entire line of lifting appliances. Because of the numerous improvements in this type of Jack, less time, less power and less labor are required than with other types.

This Jack is protected by the following patents:

December 24, 1907	March 2, 1909
August 11, 1908	October 5, 1909
September 22, 1908	November 9, 1909
November 24, 1908	November 23, 1909
January 12, 1909	December 7, 1909

MADE ONLY BY

RICHARD DUDGEON

Broome and Columbia Streets, NEW YORK

Flexible Metal Hose

AMETAL HOSE

Climatic changes, steam, heat or oil, which shorten the life of rubber hose, do not affect AMERICAN METAL HOSE.

AMERICAN METAL HOSE

is used for Steam, Oil, Air, Gas, Suction or Conduit.

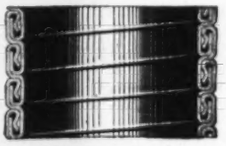
Made in copper, brass, steel or special metals.

We make interlocking, double and single groove constructions for various uses.

What are your hose requirements?

Tell us, and we will tell you what we can do for you.

Catalog "B" sent free on request



INTERLOCKING CONSTRUCTION
4 thicknesses of metal with asbestos packing.

THE AMERICAN METAL HOSE COMPANY
Factory: Waterbury, Conn.

FRANKLIN AIR COMPRESSORS
CHICAGO GIANT ROCK DRILLS

MANUFACTURED BY

CHICAGO PNEUMATIC TOOL CO.

CHICAGO
NEW YORK

The rate for display SITUATION WANTED ADVERTISEMENTS is $1.50 per inch

KEYSTONE CABLE DRILLS

For Big Blast Holes (Cat. No. 4); Artesian Water Wells (Cat. No. 1); Placer Gold Testing and Mineral Prospecting (Cat. No. 2); Oil and Gas Wells (Cat. No. 3). Traction and Portable Machines all depths to 2500 feet. Which Catalog?

KEYSTONE DRILLER SHOPS, Beaver Falls, Pa.

170 Broadway, New York
1744 Market Street, Philadelphia Monadnock Block, Chicago

Air and Gas Compressors

Enclosed, self-oiling. Fifteen types. Any volume, any pressure.

Send for Catalogue

The Blaisdell Machinery Co.
BRADFORD, PA.

"Dallett" Air Compressors

Single—Duplex—Compound
Belt and Steam Driven

Send for our literature.

Thos. H. Dallett Co.
York and 23d Sts., Philadelphia, Pa.

WHEN WRITING ADVERTISERS.

Every advertiser is rather interested to know how you got his name, and we would request that when you write, you state that you secured it from the advertisement in

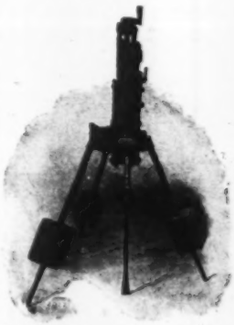
ENGINEERING NEWS

Hanna Engineering Works

2109 ELSTON AVE., CHICAGO

MANUFACTURERS OF THE

Rathbone MULTIPLE MOLDING Machine



"Sergeant" and "Little Giant" Rock Drills

Items OF Rock Drilling Cost

Every unnecessary item of rock drilling cost is that much needlessly cut off from your profits on the job. Did you ever analyze the cost of rock drilling?

The labor cost is as great for a poor drill as for the best. **But because the best drill drills faster, it has the lower labor cost per foot of hole.**

The power cost per shift is as great (and probably greater) for a poor drill as for the best. **But the best drill does more work, so its net power cost is less.**

Repair costs on a cheap, poorly built drill will be several times those on the best drill. **The cost of upkeep on the best drill, therefore, is the least per foot of hole.**

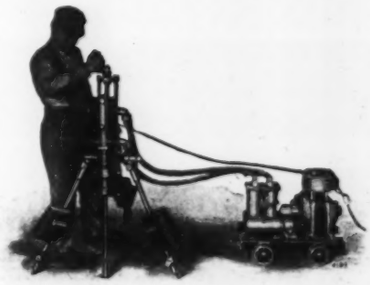
When a drill is out of commission, due to a breakdown, it is a nonproducer. It represents idle investment. **The losses due to breakdown are the minimum with the best drill.**

Looked at from every point of view, a cheap drill is a poor investment; **but the best drill is one of the best possible investments in a mine, quarry or contract.**

This is true, whether we are considering a standard piston rock drill or a hammer drill

The best drill of any type is the one which has the most behind it in the way of knowledge, experience and records of practical success.

Ingersoll-Rand drills, of every type, represent the widest experience in the world, the best design, the best methods of production, the longest record of uninterrupted success.



"Electric-Air" Rock Drills

"Sergeant" and "Little Giant" Rock Drills are the standards by which all other drills are measured.

The "Electric-Air" Drill is the only successful, practical device ever offered for drilling rock by electric power.

"Crown" and "Imperial" Hammer Drills have been adopted as standards in some of the largest mines in the world.

A mine, quarry or contract equipped with these machines, operated from an Ingersoll-Rand Air Compressor, will return the highest possible economy, even under the most difficult conditions.

A yearly record of their performance will show the largest percentage of working time, the largest footage per drill and the lowest cost for labor, power and repairs.

AIR COMPRESSORS ROCK DRILLS CORE DRILLS
"ELECTRIC-AIR" DRILLS
HAMMER DRILLS AIR TOOLS

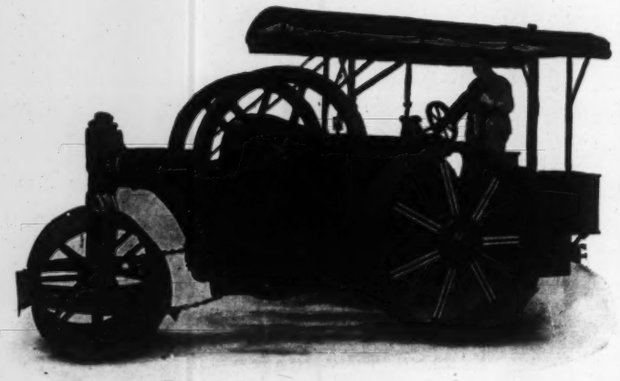
INGERSOLL-RAND COMPANY

NEW YORK LONDON

"Crown" and "Imperial" Hammer Drills

Birmingham	Los Angeles
Boston	New York
Butte	Philadelphia
Chicago	Pittsburg
Budapest	Mexico
Dusseldorf	Montreal
Johannesburg	Paris
Cleveland	St. Louis
Denver	Salt Lake
Duluth	San Francisco
El Paso	Seattle
Kobe	Toronto
London	Valparaiso
Melbourne	Yokohama

The American Motor Road Roller



Sizes: 7-8-10-12-15-Tons

Using Gasoline, Kerosene or Distillate

No Smoke, No Sparks, No Boiler Troubles, No Water Teaming

SAVES time of raising steam and washing boilers.

SAVES money in repairs and operating costs.

SEVERAL HUNDRED IN USE throughout the United States and foreign countries.

We also manufacture Motor Lawn Mowers and Rollers.

The Austin-Western Co., Ltd., Chicago

NEW YORK, N. Y. SYRACUSE, N. Y. MEMPHIS, TENN. ST. PAUL, MINN. ATLANTA, GA. DALLAS, TEX.

CASE 36 HORSE POWER 10 TON ROAD ROLLER

Time Price for Simple Cylinder $2200

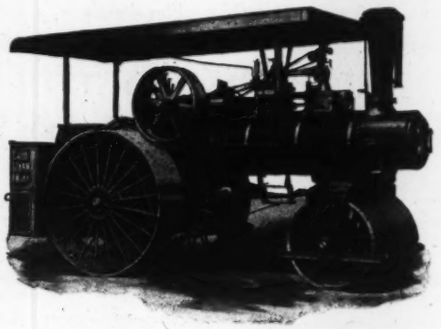
With Compound Cylinder, $2300

Six per cent. discount for cash.

Send for Catalog N

The Only Spring Mounted Steam Steered Road Roller Built

Case Rollers do the work



We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Company

(INCORPORATED)

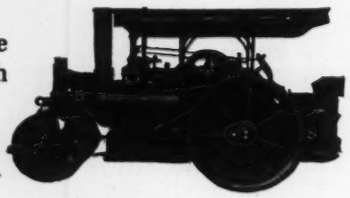
Racine, Wisconsin, U. S. A.

New York Office: 50 Church St. Telephone 469 Cortlandt
Branch House: 356-360 West Jefferson Street, Syracuse, N. Y.

Send for our General Purpose Engine and Municipal Tractor Catalog H

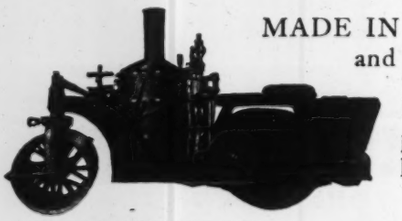
BUFFALO PITTS ROAD ROLLERS

are built to give the longest service with the least cost for operation and maintenance.



Buffalo Pitts Macadam Roller

MADE IN ALL TYPES and SIZES



Buffalo Pitts Double Drive Tandem Roller

If interested please let us hear from you.

BUFFALO STEAM ROLLER COMPANY, Buffalo, N. Y.

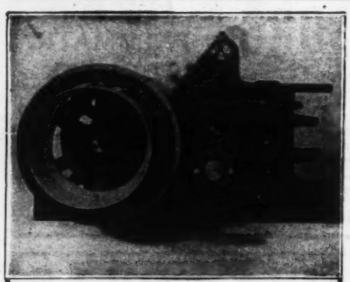
EASTERN OFFICES: 150 Nassau Street, New York City; 15 Court Square, Boston, Mass.

BROKEN STONE

FOR CONCRETE AND MACADAM

Telephone, 2488 Rector. Send for Catalogue
Calvin Tomkins, 17 Battery Pl., N.Y.

TOMKINS COVE BLUE STONE



12 x 24 Crusher on Skids. Other sizes 8 x 14, 9 x 16, 10 x 18. Portable or Stationary. Used by Pennsylvania Tunnel; D., L. & W. Tunnel.

Universal Road Machinery Co.

120 Liberty St., New York

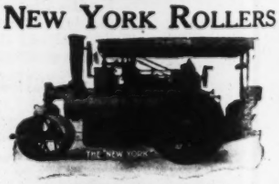
Road Rollers and Contractors' Engines

Of improved construction, in a number of sizes and styles of engines. Write for "Book for Contractors."

THE HUBER MFG. CO., Dept. 12, Marion, Ohio

New York, 126 Liberty St. Julian Scholl & Co.

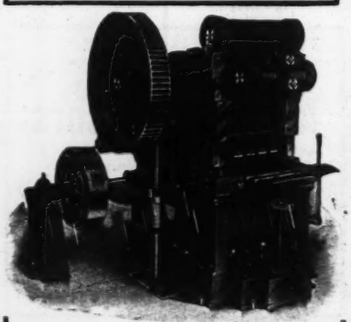
NEW YORK ROLLERS



Our ROLLERS, SCARIFIERS and SPRINKLERS are unequaled for giving the maximum of service at the minimum cost of maintenance.

CHAS. LONGENECKER & CO.

150 Nassau St., New York



We build complete equipments for making Sand Lime Brick. Also Clay Products. Write for catalogue.

THE AMERICAN CLAY MCH. CO.

WILLOUGHBY, OHIO

ERIE MACHINE SHOPS

P. W. DIETLY Proprietor

Send for our Catalogue of Asphalt Rollers and Mixers

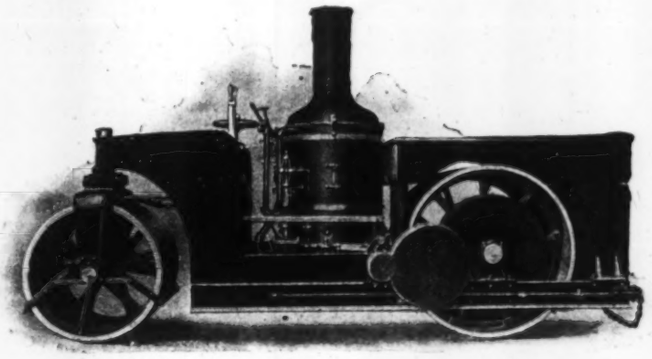
"Our 20th Century Roller"

31 West 13th Street, Erie, Pa.

FARREL ORE AND ROCK CRUSHER

EARLE C. BACON, ENGINEER.

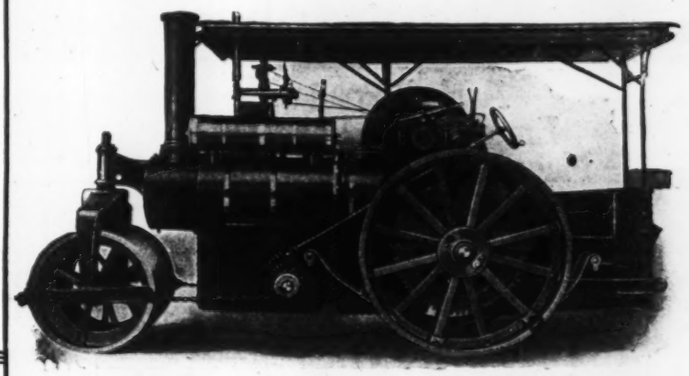
FARREL FOUNDRY & MACHINE CO. HAVEMEYER BUILDING, NEW YORK



Steam Road Rollers

All Types All Sizes
For all Purposes

THE
Kelly-Springfield Road Roller Co.
Springfield, Ohio
U. S. A.



Hawkeye Grub and Stump Machine

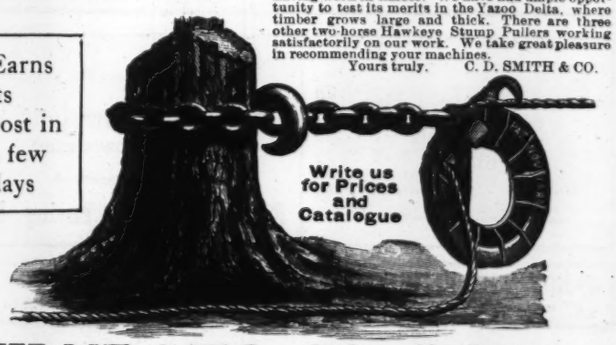
Works on standing timber or stumps. Clears three acres at a sitting. Two horses develop the power of 144 horses. Used by hundreds of contractors.

C. D. SMITH & CO., General Contractors
Main Office, 280 Front St.
MEMPHIS, TENN., Nov. 29, 1901.

Gentlemen: We are using two of the two-horse Hawkeye Grub and Stump Machines bought from you, on our railroad work in Mississippi. We consider this machine invaluable to any contractor having work in timber. We have had ample opportunity to test its merits in the Yazoo Delta, where timber grows large and thick. There are three other two-horse Hawkeye Stump Pullers working satisfactorily on our work. We take great pleasure in recommending your machines.

Yours truly. C. D. SMITH & CO.

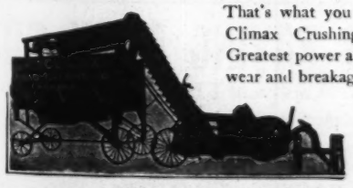
Earns its cost in a few days



MILNE MFG. CO., 894 Eighth Street Monmouth, Ill.

CRUSHED TRAP ROCK Quarry on Central R.R. of N. J.
BOUND BROOK CRUSHED STONE CO., Bound Brook, New Jersey

The Most Crushed Product—Least Cost



That's what you get when you buy and operate a Climax Crushing Plant, portable or stationary. Greatest power at least cost of operating; minimum wear and breakage—that means real economy.

Get a Catalog

The Good Roads Machinery Co.
MARATHON, N. Y.

NEW YORK OFFICE: 114 LIBERTY STREET, NEW YORK, N. Y.

SOUTH AMERICA

A Grand Cruise, leaving **New York January 21, 1911,** by the S. S. **BLUECHER,** for the East Coast of South America, through the straits of Magellan and up the West Coast to Valparaiso, Chile, across the Andes, etc. Rates **$350** upward; duration 74 days.

"South America is undoubtedly entering upon a new industrial and material movement. Its development during the next ten years will arrest the attention of the world. Its mining wealth and resources alone, especially those of gold, copper, silver, tin, platinum and nitrate, in the Andean States of Colombia, Ecuador, Peru, Bolivia and Chile, will require the investment of North American capital not unlike that already needed in Alaska and Mexico."

Other cruises to the Orient, West Indies, Around the World, up the Nile, etc.

Write for illustrated pamphlets, giving full information, rates, etc.

HAMBURG-AMERICAN LINE
41 & 45 Broadway, N. Y.

Boston Philadelphia Pittsburgh Chicago
St. Louis San Francisco

ASFALTOIL

The road oil that is adhesive, stable and uniform, for the preservation of roads and the elimination of dust. Made from Texas Oils in three grades for different classes of construction.

GULF REFINING COMPANY

General Office: Frick Building Annex, Pittsburg, Pa.

Producers, Refiners and Distributors of Oklahoma and Texas Petroleum and their Products

SALES OFFICES: Boston, New York, Philadelphia, Atlanta, Tampa, Fla., Houston, Texas and New Orleans

PLEASE FAVOR US WHEN WRITING ADVERTISERS BY MENTIONING ENGINEERING NEWS

STANDARD

Asphalt Road Oil
Emulsifying Road Oil
Macadam Asphalt Binder

Experiment and experience have demonstrated that asphalt, or oil with an asphaltum base, are the only products successfully applied to roads which insure *permanency of dust relief* and *maintain the roads in perfect condition.*

These substances are suitable for either road construction or road maintenance and are adapted for all conditions of roads and for use in all localities.

Illustrated Book Free

We will mail free upon request our book which treats of each of these three products at length, explaining the uses for which they are particularly prepared, and furnishing information which will be found invaluable to Supervisors, Road Commissioners, State, County and Municipal authorities, and to owners of private estates.

Asphalt Road Oil an asphalt-bearing oil for use on well-made roads as they are. One application, if properly applied, suffices for a season.

Emulsifying Road Oil a lighter asphalt-bearing oil, prepared to emulsify with water. Serves as a dust preventive; requires frequent application. For use on side roads, private grounds or parks, etc., where traffic is light.

Macadam Asphalt Binder a heavy product, almost solid asphaltum, used in constructing macadam and all other roads where asphaltic material is required.

STANDARD OIL COMPANY, Road Oil Department

Kansas City, Kan. 26 BROADWAY, N. Y. 115 Adams St., Chicago, Ill.

THE SICILIAN ASPHALT PAVING CO.

41 Park Row, New York

WE ARE THE WATERPROOFERS OF

The entire New York Rapid Transit Subway.
The Penn. R.R. Terminal and Tunnels in New York and New Jersey.
The N. Y. C. & H. R. R.R. Terminals and Improvements in N. Y.
The Sixth Ave. Subway of the Hudson R. Tunnel System.
Representing over 12,000,000 Square Feet Waterproofing.

WE LAY

Sicilian Rock Asphalt Floors and Pavements for Hospitals, Cellars, Kitchens, Breweries, Warehouses, Manufactories, Railroad Platforms, Sidewalks, Slaughter-Houses, Stables, etc.

SICILIAN ROCK-ASPHALT PAVEMENTS FOR STREETS, BERMUDEZ AND TRINIDAD ASPHALT PAVEMENTS FOR STREETS.

PARTICULARS AND PRICES ON REQUEST

McAvoy Vitrified Brick Co.

Standard Vitrified Brick and Block
PERKIOMEN JUNCTION, PENNA.
1345 ARCH STREET, PHILADELPHIA

J. G. Butler, Jr., Pres. C. C. Blair, Sec.
Chas. M. Crook, Gen. Man. and Treas.

Bessemer Limestone Co.

YOUNGSTOWN, OHIO

Manufacturers of

Repressed Shale Paving Block

SHAWMUT VITRIFIED PAVING BRICK WORKS,

SHAWMUT PA.

Vitrified Shale and Fire Clay Paving BRICKS and BLOCKS Burned in Yates Patent Kiln. Samples and Prices on Application. ALFRED YATES, General Manager.

CHAMPION CRUSHERS

RELIABLE, EFFICIENT and ECONOMICAL

"Champion" Stone Crushers mimimize the cost of Road Building—they're built to stand every test.

Catalog sent free

THE GOOD ROADS MACHINERY CO., Kennett Square, Pa.
New York Branch House, 114-116 Liberty Street

J. LEOPOLD & CO.

Cable Address Granite, N. Y. — 18 BROADWAY, NEW YORK. — Code Used Western Union

GRANITE PAVING BLOCKS A SPECIALTY

QUARRIES: WELLESLEY ISLAND, ST. LAWRENCE RIVER, N.Y. VINALHAVEN, MAINE.

We are prepared to make deliveries to all cities situated on Great Lakes. We are making a SMOOTH HEAD GRANITE PAVING BLOCK for the Western market that will lay a close joint.
WE CATER TO EXPORT TRADE

Please Mention ENGINEERING NEWS When Writing Advertisers

THE PURINGTON PAVING BRICK CO.

GALESBURG, ILL.

MANUFACTURERS OF

Repressed Paving Brick and Blocks

ANNUAL CAPACITY, 75,000,000

Keystone National Powder Company

EMPORIUM, PA.

BRANCH OFFICES:

New York City Pittsburg, Pa. Buffalo, N. Y. Clifton Forge, Va. Huntington, W. Va.

FACTORIES:

Keystone Works, Emporium, Pa. Emporium Works, Emporium, Pa. Sinnamahoning Works, Sinnamahoning, Pa.

CAPACITY, Eight Cars per day

PERMISSIBLE EXPLOSIVES

Passed by the U. S. Geological Survey, Pittsburg, Pa.

COLLIER POWDERS, by the Sinnamahoning Factory. **COAL SPECIAL POWDERS,** by the Keystone Factory.

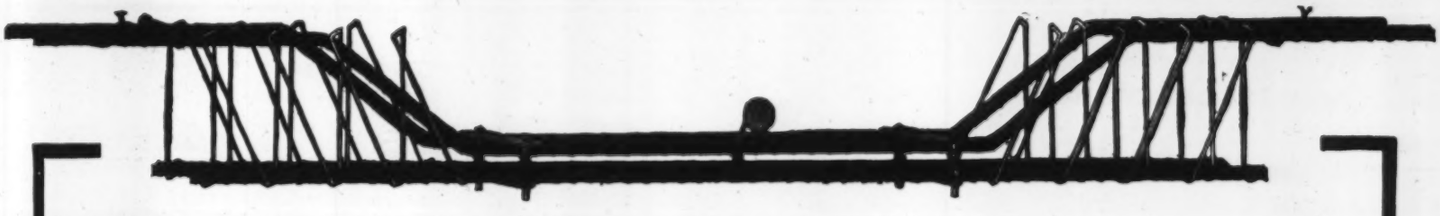
Made in all grades to meet any requirement in gaseous and dusty mines and for any kind of coal.

HIGH EXPLOSIVES

Ammonia and Nitroglycerine Dynamites for Earth, Rock or Submarine Work, and Gelatine Dynamite of unsurpassed quality for Tunnel Work.

ALL OF OUR PRODUCTS ARE GUARANTEED

Write us and we will send you the official record made by over Eleven Million Pounds of Dynamite furnished by us to the United States Government for the Isthmus of Panama last year, surpassing all previous records in efficiency. Present contract with the Isthmus of Panama, Four Million Six Hundred Thousand Pounds.



The Manufacturing Service You Secure In

Corrbar Units

means a big economy in girder and beam reinforcing.

It gives you the advantage of *wholesale* handling of a *machine*-made product as compared with *retail* handling of a *hand*-made product.

To handle your beam reinforcing on the job piece by piece, means a tremendous amount of handling.

The pieces which make up Corrbar Units are assembled in power-driven machines at our own plant, directly under our inspection and shipped to you ready to go in the form with the number of the structural member where it is to be used plainly marked on each Corrbar Unit.

Think of the economy of it.

Then think of the still more important element of safety and good workmanship. When a Corrbar Unit is put in the form its correct position cannot be disturbed when concrete is placed.

The reinforcing is always where the design provides for it to come.

And it is not necessary to adapt a design to the use of Corrbar Units. Just ask us to show you how Corrbar Units will fit into the design of *any* reinforced structure you are planning. And how they will assure the correct carrying out of your design and save money besides.

CORRUGATED BAR COMPANY

NEW YORK Metropolitan Tower | **CHICAGO** Monadnock Bldg. | **BUFFALO** Blasdell Plant | **ST. LOUIS** Bank of Commerce Bldg.

GENERAL OFFICES: ST. LOUIS, MO.

PRESSED STEEL CAR COMPANY

PRESSED STEEL CARS

PRESSED STEEL SPECIALTIES

FREIGHT AND PASSENGER EQUIPMENT

OF EVERY DESCRIPTION

All Steel or Composite Construction

OFFICES: NEW YORK PITTSBURG CHICAGO ST. LOUIS WASHINGTON, D. C.

PINTSCH LIGHT

In use on 165,000 cars, 8,600 locomotives, 2,200 buoys in Europe and America. The test of experience has proven it pre-eminent in efficiency, reliability and economy.

STEAM HEAT

Direct Steam, Direct Steam Regulating, Thermo Jet, and Water Circulating Systems, Couplers, Traps, etc. In use on 160 railroads in the United States.

THE SAFETY CAR HEATING AND LIGHTING COMPANY

2 Rector Street, NEW YORK

THE JANNEY "X" COUPLER

The latest development of the M. C. B. Coupler. Has "Lock-to-the-Lock," "Lock-Set" and "Knuckle-Opener" Janney simplicity.

MANUFACTURED ONLY BY

THE McCONWAY & TORLEY CO.

PITTSBURGH, PA.

Additional safety and economy in **Track Maintenance** has been proved by the use of Continuous, Weber and Wolhaupter base-supported rail joints—after fourteen (14) years' service, having a record of over **50,000 miles** in use—the extent of which is evidence of their excellence.

CONTINUOUS JOINT

Over 50,000 miles in use

WEBER JOINT

Rolled from Best Quality Steel

WOLHAUPTER JOINT

The Rail Joint Company

GENERAL OFFICES

Cameron Bldg., 185 Madison Ave., New York City

Makers of Base-Supported Rail Joints for Standard and Special Rail Sections, also Girder, Step or Compromise, Frog and Switch, and Insulating Rail Joints, protected by Patents

Catalogs at Agencies

Baltimore, Md. Pittsburg, Pa.
Boston, Mass. Portland, Ore.
Chicago, Ill. San Francisco, Cal.
Denver, Colo. St. Louis, Mo.
New York, N. Y. Troy, N. Y.
London, Eng. Montreal, Can.

HIGHEST AWARDS—Paris, 1900 Buffalo, 1901; St. Louis, 1904.

DAVENPORT

Dinkeys Are Built on Honor and Guaranteed in Every Particular.

Davenport Locomotive Works, Davenport, Iowa

BRANCH OFFICES

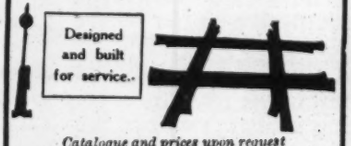
Chicago, 12 and 14 South Canal Street Minneapolis, 107 Third Avenue North
Seattle, 1215 First Avenue South
F. H. Hopkins & Co., Montreal, Que., Canadian Representative

FROGS

Switches Crossings

Stands and Portable Track

for all weights of rail for Quarries, Mines, Coal Tipples, Industrial Plants and Contractors' use.



Catalogue and prices upon request

The Indianapolis Switch & Frog Co.

SPRINGFIELD, OHIO

New York Office, 29 Broadway
J. A. FOULKS, Representative
Chicago Office, 1528-9 McCormick Bldg.
J. C. JAMESON, Representative

FOSTER

INTERLOCKING SWITCH STAND

Provides interlock and distant signal protection for facing point switches.

One throw ONE LEVER operates Switch Interlock and Signals.

Frank M. Foster
Columbus, Ohio

FACTORY TIME CHECKS

They are being Used More and More

Write for our Pamphlet "Time Checks and Their Use"

AMERICAN RAILWAY SUPPLY COMPANY

Address, Dept. I 24 Park Place, N. Y.

DUMP CARS

Mine, Plantation and Freight Cars
Castings of All Kinds

Chattanooga Car & Foundry Co.

CHATTANOOGA, TENN.

PLAIN LETTERING

By PROF. HENRY S. JACOBY

Most comprehensive book on this subject. Contains standards of U. S. Engineer Corps, U. S. Geological and Geodetic Surveys, and Mississippi River Commission.

Cloth, 10 x 7 inches: 82 pages. Price $3.00.

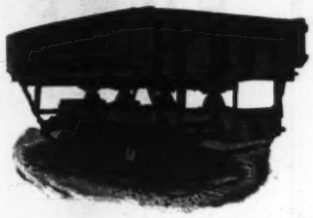
HAYES DERAILS

SEVENTEEN STYLES AND SIZES

38,000 in Use on 300 Railroads

HAYES TRACK APPLIANCE CO.

GENEVA N. Y.



"CONTINENTAL" DUMP CARS

CATALOGUE FREE UPON REQUEST

REPRESENTATIVES

Wonham, Sanger & Bates ..... New York
J. Jacob Shannon & Co. ..... Philadelphia
Standard Supply & Equipment Co. ..... Pittsburg
Joseph E. Bowen ..... Norfolk
James C. Campbell & Co. ..... Chicago
Al. H. Hoffman ..... Spokane, Seattle, Portland
H. N. Steinbarger ..... Denver
N. D. Phelps ..... San Francisco
Jones Purchasing Agency ..... Minneapolis, Kansas City, Oklahoma City

CANADIAN AGENTS

Mussens Limited — Montreal, Toronto, Winnipeg, Vancouver, Cobalt, Calgary.

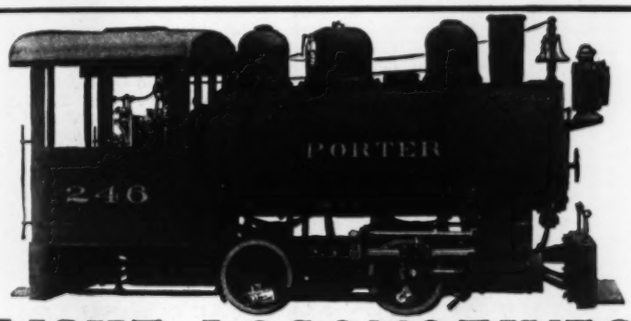
Continental Car & Equipment Company (Inc.)
Everett Building, New York, N. Y. Highland Park, Louisville, Ky.

CONTRACTORS' LOCOMOTIVES

STANDARD AND NARROW GAUGE
IMMEDIATE SHIPMENT

12 ton to 45 ton
Sturdy, simple design
Large grate area
Improved outside equalized brake rigging
Interchangeable parts

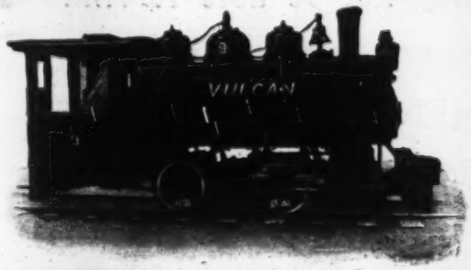
AMERICAN LOCOMOTIVE COMPANY
Railway Exchange, Chicago — 30 Church Street, New York
2101 Beaver Avenue, Pittsburgh, Pa.
MONTREAL LOCOMOTIVE WORKS, Ltd.
Bank of Ottawa Building, Montreal, Canada



LIGHT LOCOMOTIVES

STEAM AND COMPRESSED AIR
ALL SIZES, GAUGES AND DESIGNS
On Hand—Locomotives, 36 inch and 56½ inch gauge, for immediate or quick delivery
H. K. PORTER COMPANY, 531 Wood Street, Pittsburg, Pa.
NEW YORK OFFICE, Hudson Terminal Building, 30 Church Street

ARE YOU LOOKING



for a good Contractor's Locomotive? We have them in all sizes. May we send you folders and quote prices?

Prompt delivery.

VULCAN IRON WORKS
Wilkes-Barre, Penna., U. S. A.
NEW YORK OFFICE, 50 Church Street
MUSSENS LIMITED, Canadian Representatives, 229 St. James Street, Montreal, Canada

Milwaukee, Wis.

ORENSTEIN-ARTHUR KOPPEL CO.
Pittsburgh, Pa.

Gentlemen:

In regard to your inquiry, we wish to advise that we have about **50 KOPPEL CARS** in use, together with **portable tracks** for same, and like them very much. In fact, we do not see just how we could get along without them.

Yours truly,

CLEARY-WHITE CONSTRUCTION CO.

By G. H. Hailey, Chief Eng.

ORENSTEIN-ARTHUR KOPPEL CO.

General Offices
Pittsburgh, Pa.

Branch Offices

New York, 1404 Cortlandt Building. Chicago, 340 Monadnock Block. Boston, 53 Oliver Street. Pittsburgh, 1613 Machesney Building. San Francisco, 412 Chronicle Building. Baltimore, 449 Equitable Building. Denver, 412 Mercantile Building. Washington, D. C., 11 Fleming Building.

LIMA LOCOMOTIVES

Contractor's Dinkeys

36" and 56½" gauge in stock for immediate shipment.
Modern, Economical, and Durable.
Write for full information.
Catalog "R."

50 CHURCH ST., NEW YORK — 1122-3 McCORMICK BLDG., CHICAGO
The Lima Locomotive and Machine Company
116 W. SECOND STREET, LIMA, OHIO

CONTRACTORS' CARS and EQUIPMENT

No. 600, Dumping Bucket

Dumping Buckets
Turntables Wheels and Axles
Portable Track
Switches Rail

For Catalogue and Prices refer to Dept. A

THE ATLAS CAR & MFG. CO.
Cleveland, O.

BALDWIN LOCOMOTIVE WORKS

Philadelphia, Pa., U. S. A.

Broad and Narrow Gauge

Locomotives

Single, Expansion and Compound
Mine, Furnace and Industrial Locomotives
Electric Motor and Trailer Trucks

Locomotives particularly adapted for Contractors' Service
Code Address: "Baldwin, Philadelphia"

BUFFALO BLOWERS

BLOWERS

Give the best results, and the greatest amount of air with the least power, because they are the best built, heaviest and most economical.

Catalog on request

BUFFALO FORGE CO.

BUFFALO, N. Y.

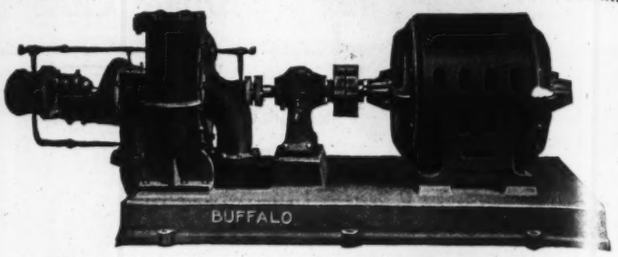
Fan System of Heating, Ventilating and Drying, Engines, Forges, Blowers, Exhausters, Punches and Shears.

BRANCHES

NEW YORK PITTSBURG PHILADELPHIA CINCINNATI ST. LOUIS CHARLOTTE CHICAGO MONTREAL

BUFFALO PUMPS

STEAM POWER CENTRIFUGAL TURBINE



Pumps of every type, for any capacity, head or type drive. State full requirements and we will make recommendations.

BUFFALO STEAM PUMP CO.

BUFFALO, N. Y.

New York Chicago Philadelphia Pittsburg Cincinnati St. Louis Kansas City, Mo. Charlotte, N. C.

Please Mention ENGINEERING NEWS When Writing Advertisers

25 to 50% INCREASE IN POWER OVER NATURAL DRAFT WITH A

"TYPHOON"

Turbine Blower

MASONED right into the wall. Occupies no floor space. Permits use of cheaper fuel and earns its cost in a short time.

Write for Bulletin Number 7

L. J. WING MANUFACTURING COMPANY

89 West Street, New York City

Branch Offices: CHICAGO, PHILADELPHIA, BOSTON

Stronger Iron and Steel

INVESTIGATE Titanium Alloy—the cheapest and most effective alloy for iron and steel ever known. Mixed with the metal in cupola, or added in furnace or ladle, it produces a product of the highest attainable quality by entirely eliminating strength-reducing impurities, both solid and gaseous.

Don't buy slag and bubbles. Insist that the metal, whether of special or ordinary composition, be purified with

TITANIUM

The Wonder-Working Alloy

Then you can be absolutely certain you have metal of the highest possible durability and strength. It will be entirely free from blow holes, brittleness and any tendency to crystallize. Tests have conclusively proved that Titanium iron and steel offer a really remarkable resistance to wear, shock, strain and corrosion. That Titanium Alloy offers much resistance to rust has been repeatedly proved by most careful tests. The cost of adding Titanium Alloy ranges from 25 cents upward to the ton of finished product. No other high grade alloy is so cheap. Titanium Alloy requires no preheating, no special equipment.

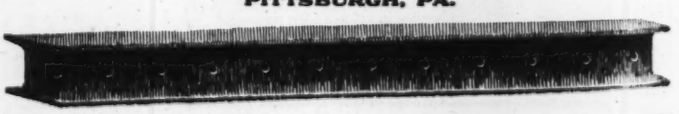
Titanium steel rails are in use on the largest railways in the country. Titanium chilled iron car wheels have been proved durable as solid steel wheels. Practically every chilled roll maker in the United States uses Titanium Alloy. Manufacturers and users of iron and steel everywhere are realizing the effects of this wonderful alloy, and what it means to them. You should by all means learn more about it.

We will gladly send you full information about Titanium Alloy. Our claims are many but easily proved.

TITANIUM ALLOY MANUFACTURING CO.

Operating under Rossi Patents. Processes and Products Fully Patented.

CHARLES V. SLOCUM, Special Agent, PITTSBURGH, PA.



Please Mention ENGINEERING NEWS When Writing Advertisers

RAMAPO IRON WORKS

MAIN OFFICE, HILLBURN, N. Y.

Cable Address, "Ramaliam"

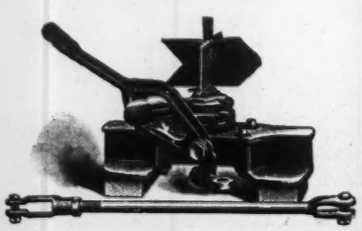
New York Office: 30 Church Street

Works: Hillburn, N. Y., and Niagara Falls, N. Y.

Safety Switch Stands

Frogs

Crossings



Plantation Cars

Portable Track

Switches Curves

You may not be able to find

WHAT YOU WANT WHEN YOU WANT IT

and then the Readers' Want Department of

ENGINEERING NEWS

can be consulted and the desired material located

The service is gratis. The results are beneficial.

The Engineering News Publishing Co.

220 Broadway, New York

BUYER'S REFERENCE

Numbers indicate pages on which may be found Advertisements of desired material

Air Brakes 11
Air Compressors 3, 7, 9, 11, 26, 27
Aluminum 50
Architects 40, 41
Architects' Supplies. (See Engineers' Supplies.)
Artesian Wells, Tools and Pumps....4, 5, 12, 13, 17, 25
Artesian Wells, Contractors 25
Asphalt 1, 16, 30
Asphalt Machinery, Tools and Paving Plant..... 28

Ballast Unloaders and Spreaders..... 69
Beam Shears 81
Bearings—Oilless 44, 68
Belting—Chain, Link, Canvas, etc. (See also Coal Handling.) 62, 63
Blast Furnaces and Fittings.....12, 13, 15, 76, 81
Blocks, Rope Fittings, etc.....61, 62, 64, 78
Blowers and Bellows.....9, 34
Blue Print Apparatus and Paper.....20, 21
Boiler Fittings, Mountings and Parts..... 8
Boilers.....1, 8, 10, 12, 13, 15, 60, 76, 81
Bolts, Expansion, Toggle, etc.....50, 52
Boots and Shoes—Heavy 22
Brick—Fire and Tile 1, 30, 52, 84
Brick—Sand and Paving.....1, 30
Brick—Sand-Lime 1
Brick-Making Machinery 28
Bridges, Roofs, Trusses, etc., 12, 13, 36, 55, 66, 74, 76, 77, 78, 79, 80, 81, 82
Bridges—Bascule 13, 78, 82
Buckets—Coal, Ore, Dredging, etc., 33, 38, 56, 62, 63, 64, 65, 66, 67, 68, 70
Bumping Posts 44

Cableways—Suspension Wire Rope.....60, 61, 62, 64, 68
Caissons 13, 36, 51, 78
Calculating Machines 20
Car Heating and Lighting..... 32
Car Couplers 1, 32, 33, 53
Car Parts and Fittings.....1, 32, 33, 53
Cars.....32, 33, 34, 45, 52, 53, 62, 63
Cars—Dump 33
Cars—Second-Hand. (See Second-Hand Supplies.)
Cars—Tank 12, 13
Carts—Concrete Spreading 58
Carts and Wagons—Contractors.....28, 29, 52, 53
Castings and Forgings—Iron—Steel.....14, 15, 16, 76
Castings, Manganese Steel.....1, 68
Cement-Making Machinery.....1, 62, 72, 73
Cement—Natural and Portland.....1, 72, 73, 84
Cement—White Portland 72
Cement Waterproofing 72
Chain Blocks 63
Channeling Machines 26, 27
Checks—Time and Merchandise 32
Chemical Laboratories 1, 24
Chimneys—Brick 7
Chimneys—Concrete 7
Chimneys—Iron and Steel.....12, 13, 81
Chutes—Mail 50
Coal and Ore Handling and Conveying Machinery, etc., 1, 53, 62, 63, 65, 66, 68, 78
Computing Machines 20
Concrete Mixers and Machinery.....1, 53, 56, 57, 58, 59
Concrete Construction.....36, 37, 55, 74, 75
Condensers 4, 5, 8, 50, 53
Conduits—Vitrified Clay 1, 19
Contractors.....17, 24, 36, 37, 51, 53, 54, 67, 74, 76
Converters and Cooling Towers.....13, 50, 81
Conveyors and Conveying Machinery. (See Coal and Ore Handling.).....55, 61, 63, 66, 68, 78
Creosoting 71
Crusher Parts, Manganese Steel.....1, 68
Crushers and Pulverizers.....1, 25, 28, 29, 30, 59, 73
Cupolas—Foundry 1

Dams—Concrete Steel 36
Derails 32
Derricks and Derrick Fittings.....60, 61, 62, 65, 68
Ditching Machinery.....45, 54, 65, 67, 68, 69
Diving Apparatus 71
Doors and Shutters 50
Dredges 67, 68, 69
Dredging Contractors 54, 67
Drills, Diamond 26
Drills—Rock and Ore 26, 27, 68
Dust Preventive 30, 49
Dryers and Drying Apparatus.....1, 9, 13, 34, 53, 72
Dynamite, Explosives, Exploders.....25, 31

Ejectors 53
Electrical Machinery, Dynamos, etc.....3, 9, 11
Employment Bureaus 43, 44
Engineers—Civil, Consulting and Mechanical.....40, 41
Engineers' Supplies, Instruments, Clocks, etc., 20, 21, 22, 23, 24
Engines—Gas, Gasoline and Oil.....6, 18, 26
Engines—Hoisting 60, 61, 62, 63, 68
Engines—Pumping 1, 4, 5, 7, 8, 34, 50
Engines—Stationary 4
Engines—Traction 28
Expanded Metal 31, 74, 83
Excavating Machinery. (See Ditching Machinery.)

Fans—Exhaust. (See Ventilating.)
Feed-water Heaters and Purifiers.....7, 8, 50
Filters—Grease and Oil 8, 84
Filters—Water 1, 8, 17, 84
Fire Department Supplies.....17, 71
Fireproof Construction—Steel, 31, 37, 48, 50, 55, 74, 75, 77, 80, 83
Fireproofing Materials.....31, 37, 50, 74, 77
Flume—Galvanized Steel 13
Flush Tanks 51, 53
Forgings. (See Castings.)
Foundations 36, 76
Foundry Equipments and Supplies.....1, 34, 68, 81
Frogs and Switches—Railway.....32, 33, 53, 34
Fuel Economizers 8
Furniture and Office Fittings.....20, 21

Garbage Disposal 53
Gas Machinery, Fittings and Fixtures, Compressors, etc.....6, 15, 25, 26
Gaskets—Bronze and Copper.....1, 16
Gates—Sluice 17
Gearing 62, 68
Gloves 22
Governors—Water-Wheel 10
Graders and Scrapers—Earth. (See Road Machinery.)
Granite 30
Graphite and Belt Dressing.....10, 50, 79

Hangers—Joist 68
Hoists.....1, 60, 61, 62, 63, 65, 66, 68
Hose and Fittings.....26, 27
Hydrants and Street Washers. (See Valves.)
Hydraulic Presses 7, 52
Hydraulic Rams 5

Inspection of Building Materials.....1, 24
Instruments—Engineering, Surveying and Mathematical. (See Engineers' Supplies.)
Instruments—Recording 84

Jacks—Hydraulic and Screw..... 27
Joints—Expansion 17
Joints—Flexible 17

Kilns—Cement. (See also Dryers).....1, 72, 73

Ladles—Foundry.....1, 12, 13, 68, 81
Lamp Posts 14
Leadite 14
Locomotives—Compressed Air 32, 33
Locomotives—Electric 3, 9, 32, 33
Locomotives—Geared 33
Locomotives—Industrial and Light. (See also Second-Hand Supplies) 32, 33, 44, 45
Locomotives—Steam 32, 33
Logging Outfits and Machinery..... 60

Meters, Meter Boxes and Fittings.....18, 50
Mineral Wool 1
Mine Timbers—Steel 79
Mining and Mill Machinery and Supplies. (See also Coal and Ore Handling).....1, 7, 26, 27, 62, 68
Mixers—Cement, Asphalt and Mortar.....72, 73
Motor Truck 51
Motors—Electric 11

Nuts and Nut-Locks.....50, 52

Ornamental Iron Work. (See Bridge.)

Packing—Flange and Joint..... 16
Paint, Varnish, Metal Coatings.....1, 10, 50, 79
Paving Blocks—Stone 30
Paving Blocks—Wood 71
Photographs 1
Pile Drivers, Hammers and Jets.60, 62, 65, 68, 69, 70, 71
Pile Shoes 71
Piles and Piling—Concrete 36, 70
Piles—Interlocking 79
Piling—Steel 2, 79
Pipe Coating and Covering.....1, 16
Pipe—Iron and Steel.....14, 15, 17, 50
Pipe—Reinforced Concrete 16
Pipe—Riveted Steel 12, 13, 15, 51, 78
Pipe—Vitrified Clay and Sewer.....1, 15, 19, 30, 53
Pipe—Wooden 1, 15, 71
Pipe Cutting and Threading Machines.....16, 17
Pipe Fittings (Brackets, Hangers, Repair Sleeves, Strainers, Etc.) 7, 14, 17
Pipe Joints—Flexible Water Pipe and High Pressure Pipe 14, 17
Plows—Contractors'. (See Road Machinery.)
Pneumatic Conveyors 62
Pneumatic Tools, Riveters, Clippers, Etc.....25, 26, 27
Poles and Posts—Iron and Steel, Trolley Posts, Etc... 14
Power Transmission Machinery.....11, 62, 63, 68
Pulleys and Blocks.....61, 62, 68, 78
Pulverizers. (See Crushers.)
Pumps—Air Lift and Artesian.....4, 5, 17, 26, 27
Pumps—Boiler Feed.....4, 5, 7, 34, 50
Pumps—Centrifugal.....4, 5, 7, 10, 34, 68
Pumps—Diaphragm 4, 6, 7
Pumps—Mine 4, 5, 7
Pumps—Turbine 4, 5, 7, 10
Pumps—Vacuum 4, 7, 26, 50
Pumps—Well 4, 5, 7, 17
Pumps—Windmill 7, 12, 13, 17
Punches—Pneumatic 27
Punching and Shearing Machines.....25, 81

Railings, Guards, Fences, Etc.....78, 81
Rails.....33, 34, 44, 45, 47, 53
Rail Joints, Fastenings, Etc..... 32
Rails—Second-Hand. (See Second-Hand Supplies and For Sale Ads.)
Railway Track Specialties and Equipment.....32, 33
Reinforced-Concrete Construction. (See Fireproof Construction.)
Riveters 25, 26, 27
Road Machinery, Road Rollers, Plows, Screens, Etc.....28, 29, 45, 52, 53, 60
Road Preservative 30, 49
Rolling Mill Machinery 68
Roofing.....49, 55, 74, 76, 81
Rope Fittings, Couplings and Cordage.....63, 64
Rules and Tapes.....20, 21, 23

Sand Sifters 27
Scows—Steel Deck and Dump..... 68
Scraper Buckets 68, 69
Scrapers—Road. (See Road Machinery.)
Schools and Colleges 24
Second-Hand Supplies and Agents.....44, 45, 46, 47
Separators—Steam, Grease and Oil.....8, 14
Sewage and Garbage Disposal and Septic Tanks....51, 53
Sewer Appliances and Specialties.....16, 17, 53, 56
Shears—Structural Steel 25, 81
Sheaves for Wire Rope, Hoisting.....61, 62, 68, 78
Sheet Iron and Sheet Metal Work.....12, 13, 15
Sheeting—Steel 2, 99
Shovels—Steam 45, 67, 68, 69
Skylights and Sidewalk Lights.....37, 76, 79
Spiral Stairs 52
Standpipes and Tanks. (See also Tanks and Towers) 10, 12, 13, 51
Steam Specialties 7
Steel 48
Steel Sheeting 56
Stokers—Mechanical 8
Stone—Broken, and Quarries.....28, 30
Strainers—Well 17
Structural Steel 79, 82
Superheaters—Steam 8
Switch Stands and Switches. (See Frogs.)

Tanks—Gas and Oil 12, 13
Tanks—Grain and Storage 12
Tanks and Towers.....10, 12, 13, 15, 51, 53, 78, 81
Tapes—Steel. (See Rules and Tapes.)
Teeth—Steam Shovel 1, 68
Testing Laboratories 1, 24
Testing Machines and Scales.....8, 73
Thermit 53
Ties—Steel and Wood..... 71
Tipples and Bunkers..... 63
Titanium 34
Tools—Calking 17
Track—Portable 33, 34, 53
Trench Braces 53
Trench Machines 54, 84
Trolleys 63
Turbines—Steam 3, 4, 9, 10, 11
Turbines—Water 10
Turnbuckles 50
Turntables.....1, 13, 33, 53, 76, 81, 82

Valves and Valve Boxes.....8, 10, 14, 17, 18
Ventilating Apparatus 8, 34
Ventilators 34

Wagons—Dump. (See Carts.)
Water Power Plants and Equipment.....10, 36, 68
Waterproofing. (See also Asphalt and Paint.) 1, 16, 30, 37, 49, 50, 77, 84
Waterproofing Materials 50, 72, 77
Water Softening Plant.....1, 8, 84
Well Drilling. (See Artesian Wells.)
Wheelbarrows—Iron, Steel and Wood Plows, Etc..... 52
Wheels—Steel Car 70
Windmills. (See Pumps—Windmill.)
Winches 63
Wire Rope and Aerial Tramways. (See Cableways.)
Wood Preservative 74

THE FOUNDATION COMPANY

CHICAGO NEW YORK NEW ORLEANS

THE FOUNDATION COMPANY, LIMITED—MONTREAL, CANADA

With the completion of the Woolworth Building, this Company will have sunk over

1,000 Concrete Pneumatic Caissons

in various parts of the UNITED STATES and CANADA.

IMPORTANT NEW CONTRACTS

have recently been awarded to this Company.

THE WOOLWORTH BUILDING

S.W. Corner Broadway and Park Place. 105' on Broadway and 197' on Park Place. Area covered 18,500 sq. ft. It will contain 45 stories and rise to a height of 625 ft. above the street. Its foundations will consist of 38 caissons carried to bed-rock at a depth of about 112' below curb, or 77' below water level. There will be three floors below street level, the lowest to be 37 feet 6 inches below curb.

THE ZINN BUILDING

25th St. and 11th Ave. 11 stories. 36 caissons sunk to bed-rock at a depth varying from 42' to 71' below curb.

HAUSER DAM

Missouri River, Helena, Montana. For United Missouri River Power Co. 9 pneumatic caissons. 60' below water level.

DOUBLE TRACK RAILROAD BRIDGE

St. Lawrence River, Montreal to Farnam, Canada. Canadian Pacific R.R. Co. 7 pneumatic caissons. 12 open caissons. 2 abutments.

CANADIAN LIGHT & POWER CO.

Transmission line across St. Lawrence River, Montreal, Canada. 6 pneumatic caissons.

DOMINION EXPRESS BUILDING

Montreal, Canada. Dominion Express Co. 41 pneumatic caissons. Maximum depth to bed-rock about 71'.

CONTRACTS JUST COMPLETED

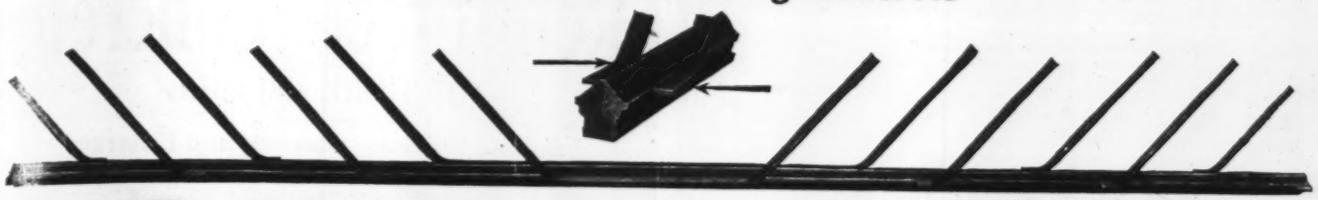
MUNICIPAL BUILDING—City Hall, New York City. 25 stories and tower. Height, 560 ft. 106 pneumatic caissons.

BANKERS' TRUST BUILDING—S.W. corner Wall and Nassau Sts. 39 stories. Height 585 ft. 18 pneumatic caissons—to bed-rock about 60' below curb.

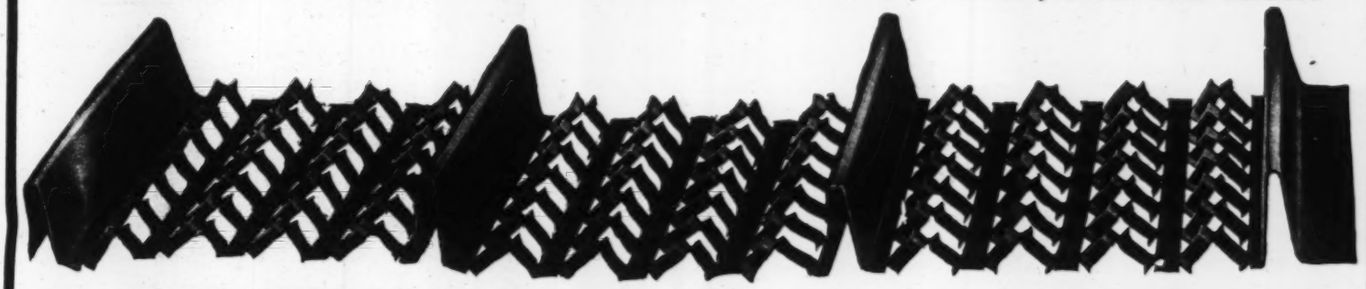
WINDSOR STATION, CANADIAN PACIFIC R.R.—Montreal, Canada. 300 caissons sunk to bed-rock.

STANDARD OIL COMPANY—Foundations for refinery buildings, tanks, etc.

Kahn System—the ONE Organization with a COMPLETE Line of Products for Reinforcing Concrete



KAHN TRUSSED BARS with Rigidly Connected Shear Members for Beams, Girders, Joists and Arches



HY-RIB Does away with Centering and Studs in Roofs, Sidings, Floors, Walls, Partitions, Ceiling and Furring

RIB BARS Stock or Mill Delivery—Rush Shipments—Lowest Prices. Furnished in All Sizes and Either Straight or Bent.

RIB METAL for Concrete Slabs, Walls, Sewers and Conduits
BUILT-UP SPIRAL HOOPING for Columns
RIB LATH AND RIB STUDS for Plaster and Stucco
TRUS-CON CHEMICAL PRODUCTS for Waterproofing and Finishing Concrete

Remarkable strength of United Steel Sash. Eight men are balanced on the ventilator.

United Steel Sash

FOR FIREPROOF WINDOWS

MAXIMUM STRENGTH AND DAYLIGHT.—The frame is made of deep, narrow, symmetrical sections, which are not weakened by punching or cutting, and offer practically no obstruction to the light.

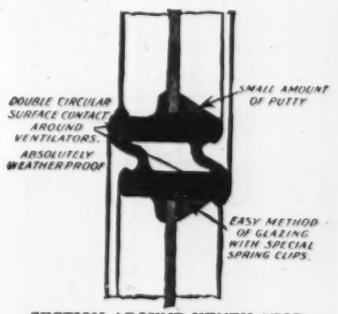
WEATHERPROOF VENTILATORS.—Span the full width of each unit, giving maximum ventilation, and have continuous double, circular, surface contact, which effectively shut out draft and rain.

GLAZING.—Our special spring clips, by doing away with troublesome iron pins, reduce the cost of glazing and simplify reglazing.

WORKMANSHIP.—United Steel Sashes are machine-built, with multiple dies, operated by powerful presses, producing a sash of absolute accuracy, uniform finish and attractive appearance.

SIZES.—Sashes are made to receive glass 10 to 15 inches wide and 16 to 30 inches high; are furnished in units to fit any sized window opening, and to meet all requirements of ventilation, construction, details, etc.

Catalogues, estimates and detailed suggestions FREE.


DOUBLE CIRCULAR SURFACE CONTACT AROUND VENTILATORS. ABSOLUTELY WEATHERPROOF
SMALL AMOUNT OF PUTTY
EASY METHOD OF GLAZING WITH SPECIAL SPRING CLIPS

SECTION AROUND VENTILATOR.

Trussed Concrete Steel Co.

912 Trussed Concrete Bldg., DETROIT, MICH.

KAHN SYSTEM
Reinforced Concrete

At the Chicago Cement Show, Feb. 17th to 23d. Spaces 77, 78 and 79.

STUEBNER'S
"Excelsior" Bottom Dumping Bucket

Designed to meet a growing demand for a quick-acting, clean dumping and labor saving bucket.

BACKED BY THIRTY YEARS' EXPERIENCE

Trade Mark "EXCELSIOR" Registered

"Excelsior" Bottom Dump
(Patented)

The General Contractors' Bucket, particularly adapted to handle Concrete, Mud, Clay, Sand, Rock, etc.

It dumps material rapidly and cleanly, and piles it up in circular heaps just where it is wanted.

No springs are employed in this Bucket. This prevents premature dropping of load while in transit.

The Locking Device is so constructed that weight of load in Bucket holds bottom in place.

Operating mechanism, simple in design, strong, powerful and rapid in operation.

No Side Jumping

No Side Splashing

Load Dumps Free and Clear of Operator

The "Excelsior" Bucket can be seen operating in all sections of the country. It has earned for itself the endorsement of many contractors and other users, and the approval of the workmen themselves—who are oftentimes the best judges. It is the most popular Bucket of the day. **Over 5000 In Use.**

Stuebner's Controllable Central Discharge Bucket

Controllable Bottom Dump
Patented (others pending)

A fair and impartial trial of this Bucket, in connection with any other make of a similar type, will quickly convince you, as it has others, that it is the **BEST DESIGNED, HEAVIEST, MOST PERFECTLY CONSTRUCTED** and **BEST WORKING BUCKET** on the **MARKET.**

Always under control of the operator.

Can be used on the smallest as well as the largest forms.

They are used by the New York Central R.R. Co. on their vast improvements at Grand Central Station, N. Y., on the New York City Aqueduct, and many other large improvements.

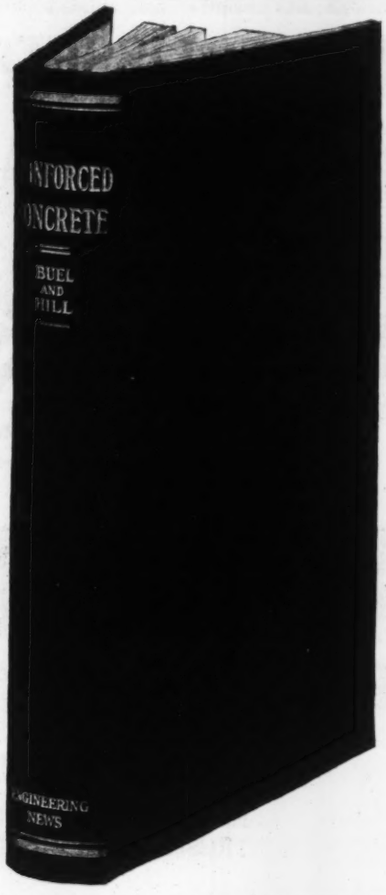
G. L. STUEBNER, IRON WORKS
West 11th Street, Long Island City, N. Y.

THE STANDARD TREATISE ON THE SUBJECT

Reinforced Concrete

By BUEL and HILL

Second Edition. Revised and Enlarged



CONTENTS.—PART I.—Methods of Calculation: Economic Use and Properties of Reinforced Concrete—Beams and Theories of Flexure—Columns—Retaining-walls, Dams, Tanks, Conduits and Chimneys—Tests and Designs of Arches.

PART II.—Representative Examples: Foundation Construction in Reinforced Concrete—Reinforced Concrete in Building Construction—Reinforced Concrete in Bridge and Culvert Construction—Examples of Reinforced-Concrete Conduit Construction—Examples of Reinforced Tank and Reservoir Construction—Example of Reinforced-Concrete Retaining-walls, Dams, Chimneys, Etc.

PART III.—Methods of Construction: Material Employed in the Fabrication of Reinforced Concrete—Methods of Construction in Foundation-Work—Methods of Construction in Building-Work—Methods of Construction in Bridge-Work—Methods of Construction in Conduit-Work—Facing and Finishing Exposed Concrete Surfaces.

APPENDICES: "A." Prof. Arthur N. Talbot's Tests of Reinforced-Concrete Beams, Series of 1905—"B." Watertown Arsenal Tests of Reinforced-Concrete Columns, 1904, 1905 and 1906—"C." Richard T. Dana's Method of Proportioning the Ingredients in Portland-Cement Concretes.

This book is a treatise for designing and constructing engineers, following American practice and governed by the conditions which prevail in America. Theoretical discussions have been omitted, and in their place have been supplied practical working formulas, examples of representative structures and records of actual practice in the selection of materials and methods of workmanship and construction.

In Part I are given working formulas for the calculation of all classes of structures in reinforced concrete and such facts about the properties of concrete and steel as are necessary in developing economical engineering designs. Part II contains illustrations and descriptions of a large number of representative structures of reinforced concrete. These record actual practice in design and show the adaptability of reinforced concrete to various types and forms of structures. Materials, workmanship and methods of construction are considered in Part III, and are illustrated by numerous examples from actual practice. In this part special attention is given to the construction of centers and forms for concrete work and to methods of facing and finishing exposed concrete surfaces.

"This work appeals to us as the standard American text-book upon the subject."—*Municipal Journal and Engineer*

"An extremely timely and thoroughly satisfactory treatise."—*American Machinist.*

As a record of what has been done in recent years in the way of concrete construction, this book is invaluable."—*Architect and Contract Reporter* (London).

"It will be a guide to the student by affording him practical working formulas and methods of computation sufficiently accurate for designs, and the builder and constructor will find in it an extensive repertory of existing examples which he may consult with advantage."—*The Engineer* (London).

Cloth, 6 x 9 inches; 499 pages; tables, diagrams and 340 illustrations

PRICE, $5.00 NET

THE ENGINEERING NEWS PUBLISHING COMPANY
220 Broadway, New York

ALPHABETICAL LIST OF ADVERTISERS

Abenaqui Mach Wks 26
Abendroth & Root Mfg Cos 15
Acme Eng & Eng Co.... 54
Adams, D S 40
Aetna Exc Bureau 40
Ainsworth Wm & Son.... 23
Albany Sanitary Bureau.. 40
Albany Pump Co 4
Alberger Pump Co 4
Albree Iron Wks Co, C B. 25
Albright & Mebus 40
Aldrich Pump Co 4
Alexander Iron Works..... —
Allen, Edw Am Mang S Co 1
Allen, John F Co..... 26
Allentown Ptd Cement 72
Allis-Chalmers Co 1
Aloe Co, A S..... 22
Alpha Exc Co..... 22
Alpha Ptd Cement Co 72
Alsens Portland Cement... 84
Altenederer, Theo & Sons.... 20
Aluminum Co of America.. 50
Ambursen Hydr Const Co. —
Alvord, John W..... 40
Am Asphaltum & Rub Co. 1
Am Air Compressor Wks. 26
American Blower Co 8
American Bridge Co..... 82
Am Bureau Imp & Test Co 24
Am Cast Iron Pipe Co..... 14
American Cement Co 84
Am Cement Engineering Co 73
Amer Clay Machy Co 28
Amer Comp & Pump Co.. 26
Amer Creosote Works 71
Amer Creosoting Co ..... —
Amer Dist Steam Co..... 14
Amer Drafting Furn Co... 20
Amer Eng Corp 40
Amer Gas Furnace Co.... —
Am Hoist & Derrick Co... 61
Amer Locomotive Co 33
Amer Metal Hose Co..... 27
Amer Pipe Mfg Co 13
Amer Process Co 72
Amer Ry Supply Co..... 32
Amer Rockcutter Co ..... —
Amer Rolling Mill Co.... 1
Amer School of Corres .. —
Amer Spiral Pipe Wks.... 15
Amer Steel & Wire Co.. 75
Am System of Reinforcing 77
Amer Vanadium Co ..... —
Am Water Cleaning & Cont Co. ..... —
Amer Water Soft Co ..... —
Amer Well Works..... 5
Andresen-Evans Co ..... —
Arch & Engr Supply Co.. 21
Armour Institute 24
Arnold, B J 40
Arnold Co 40
Arnott R Fleming 40
Asbestos Protect Metal Co —
Atlantic Creo & Wood P Co 71
Atlantic Equip Co.....69-45
Atlantic, Gulf & Pac Co.. 67
Atlas Car & Mfg Co..... 33
Atlas Dryer Co 72
Atlas Ptd Cement Co 84
Austin Drain Ex Co, F C. 54
Austin Mfg Co 73
Austin Western Co 28
Avery, Chas F..... 44
Avery Company ..... —

Babcock & Wilcox Co 8
Backus Water Motor Co.. 6
Bacon Earl Co..... 28
Balcomb, Jean Bart 40
Baldwin Loco Wks 33
Baltimore Bridge Co.... 78
Baltimore Cooperage Co.... 13
Barber Asphalt Pav Co. 71
Barbour, F A 40
Barrett Mfg Co 49
Bartlett, C & Snow Co.... 53
Bausch & Lomb Optical Co. 20
Beatty, M & Sons 68
Belmont Iron Works 81
Berger, C L & Sons..... 22
Berger Mfg Co..... 74
Berlin Construction Co... 78
Berquist, A S..... 63
Bessemer Limestone Co.. 30
Billings-Chapin Co ..... —
Billings, King Co ..... —
Blackmer & Post Pipe Co. 1
Blaw Collap Stl Centg Co 56
Blaisdell Mach Co..... 27
Blake-Knowles Stm P Wks. 8
Block-Pollok Iron Co 45
Blumenstein, W H..... —
Bogue, Virgil G 40
Bond, Harold L.....71-26
Bonecou, Daniel 40
Booth Co, L M 8
Booth, Garrett & Blair.... 24
Boston Bridge Wks..... 76
Boston & Lockport Blk Co. 62
Boudinot, Allen R 40
Bound Brook Crushed Stone Co 29
Bourbon Cop & Brass Wks. 17
Bowman, A L 40
Braden, James S 47
Bradley Pulverizer Co..... 73
Briggs, Marvin 44
Briggs, Oscar H 40
Bristol Co, The 84
Broderick & Bascom R Co 64
Brown Hoisting Mach Co. 55
Browning Eng Co 66
Browning Mfg Co..... —
Brownlee, James L 40
Bryan, W H 40
Bucyrus Company 69
Buel, A W 40
Buffalo Forge Co 34
Buffalo Meter Co 17
Buff & Buff.....21-22-23
Buffalo Steam Pump Co.. 34
Buffalo Steam Roller Co.. 28
Builders Iron Fdy Co.... 50
Burdick, Chas B 40
Burt Mfg Co..... —
Bury Compressor Co..... 26
Business Service Co 43
Buyers' Reference 35
Byers, John F Mach Co. 61
Byerley & Sons ..... —

Caird, James M 40
Caldwell, H W & Sons Co. 62
Caldwell, W E & Co..... 12
Cameron, A S, S P Wks.. 5
Cameron Septic Tank Co.. 40
Carbolineum W Pres Co.. 71
Cardinell Vincent Co .... —
Carlin Machy Supply Co. 44
Carlin Sons Co, Thos 60
Carnegie Steel Co 79
Carroll, Porter T B Co.. 51
Carson Trench Mach Co.53-84
Carter Construction Co.... 76
Case Thresh Mach Co, J I 28
Cement Age ..... —
Central States Bridge Co. —
Ceresit Waterproofing Co. —
Chester & Fleming 40
Champion Bridge Co 81
Chattanooga Car & Fdy Co 32
Chicago Bridge & Ir Wks. 13
Chicago Concrete Machy.. —
Chicago Housewrecking Co 44
Chicago Pneumatic Tool Co 27
Chicago Ptd Cement Co .. 73
Chicago Sheet Tape Co.... 20
City Wastes Disposal Co.. 40
Clarkson School of Tech. 24
Cleveland City F & I Co. 50
Cleveland Eng Agency 43
Clinton Br & Ir Co 76
Clinton Wire Cloth Co 83
Clow, J B & Sons 14
Clyde Iron Wks 60
Cockburn Barrow & Mach Co ..... —
Coffin Valve Co 17
Colby, J A 40
Colwell-Wilcox Co 17
Cole Co, The H..... —
Cole, John A & Edw S 40
Cole Bros 25
Collins, Chas E 40
Conrad, Wm R 24
Concrete Steel Co 74
Concrete Steel Eng Co 77
Condron & Sinks 40
Congelton, Osborn 40
Congelton & Boardman .. 40
Cons Expanded Metal Cos 74
Cons Rosendale Cement Co. 84
Cont Car & Equip Co..... 33
Contractors Plant Mfg Co. 60
Cook, Well & Co 17
Cooper & Powelson 40
Coplay Cement Mfg Co.... 73
Corrugated Bar Co 31
Crocker-Wheeler Co 11
Cummer, F D & Sons 72
Cutler Mail Chute Co 50
Cummings Structural Concrete Co 76
Cyclone Drill Co ..... —

Dake Engine Co 61
Dallet, Thos H Co..... 27
Dallett & Co 44-45
Darling Pump & Mfg Co.. 8
Darrach, Chas G 40
Davenport Loco Wks 32
Davis, G M & Son ..... —
Dayton Globe Iron Wks .. 10
Dean Bros Steam Pump W 4
De Laval Steam Turb Co.. 4
De Le Vergne Mach Co .. —
Deming Co 7
Des Moines Br & Ir Wks.. 12
Detroit Graphite Co 50
Detroit Leather Specy Co.. 16
Dickey, W S Clay Mfg Co. 1
Dimmick Pipe Co 14
Dixon, Jos Crucible Co .. 10
Dobbie Fdy & Mach Co .. 61
Dodge, J M Co..... 63
Donaldson Iron Co..... 14
Dow & Smith 40
Drum Co, A L 40
Drummond, M J & Co 14
Dudgeson, R 27
Duff, Samuel E 40
Dunham, H F 40
Du Pont Co ..... —
Du Vivier, E H 23

East Jersey Pipe Co..... 15
East St Louis Eng Co.... 40
Economy Draw Table Co.. 20
Edison Port Cement Co.. 73
Edson Mfg Co 4
Egleston, T C 13
Elec Test & Research Lab. 24
Ellicott Mach Co 67
Elliott Co, B K 21
Emerson Laboratory 24
Emerson Steam Pump Co. 5
Engineering Agency 43
Epping-Carpenter Co 4
Eppinger & Russell Co .. 71
Erie Machine Shops 28
Eureka Machine Co 56
Evans & Howard Fire Brk. 1
Exeter Machine Wks 66

Fairchild, S E Jr 40
Fanning, J T 40
Farley, J M 40
Farrell Fdy & Mach Co.... 28
Fayette Eng Co 40
Ferguson Contracting Co.. 76
Field, Wm P 40
Fitz-Hugh, Luther Co 46
Flad, Edward & Co 40
Flory, S Mfg Co 60
Foos, The Gas Engine Co . 6
Foote Concrete Mach Co. 58
Fort Pitt Bridge Wks 81
FOR SALE 44-45-46
Foster, Frank M..... 23
Foundation Co 36
Fowler, C E 40
Fox, John & Co 14
Fox & Peck 40
Fredenburg & Lounsbury. 84
Frey & Co, Louis P ..... —
Frye, Albert I 40
French, Samuel H & Co. 84
Fuertes, James H 40
Fuller Engr Co ..... —
Fuller, Frank L 40
Fuller, George W 40
Fuller & Manley 40

Gandy Belting Co ..... —
Garwood Electric Co ..... —
Gayler, Carl 40
Geier & Bluhm 22
Gem City Boiler Co 8
General Concrete Cons Co. 7
General Electric Co 3-9
General Fireproofing Co.... 77
Gilbert, G H 40
Gilbreth, Frank B 76
Gillespie, T A & Co..... 51
Glamorgan Pipe & Fdy Co 14
Glens Falls Port Cement Co 72
Glidden Varnish Co ..... —
Gobeen Mfg Co 79
Goit Mfg Co 58
Golden-Anderson Valve S S Co 17
Goldschmidt Thermit Co .. 53
Good Roads Mach Co 29-30
Goodrich Co, B F, The.... 1
Gouids Mfg Co 7
Gray, Samuel M 40
Green Fuel Economizer Co. 8
Gulf Refining Co 30
Gulick, Henderson & Co.. 24
Gurley, W & L E 23

Haiss Mfg Co, Geo..... —
Hamburg-Amer Line 29
Harbison-Walker Refractories Co ..... —
Hanna Engineering Wks.. 26
Hardmuths, L & C 23
Harper Machy Co 44
Harris Incinerator Co .... —
Harrison Safety Boiler Wks 8
Harrison Waterproof Co .. 50
Hartranft, Wm G Chem Co. 84
Haskins, C A 40
Hatton, T Chalkley 40
Hayden Mach & Supply Co 44
Hayes Track Appliance Co. 32
Hayward Co, The 65
Hazard Mfg Co 63
Hazen, Allen 40
Hazelhurst & Anderson ... 40
Healey, H G 1
Hedrick & Cochrane 40
Helderberg Cement Co .... —
Heller & Brightly 24
Helwig Mfg Co ..... —
Hennebique Cons Co .... —
Hepp, Augustus C 40
Hering, Rudolph 40
Hersey Mfg Co 18
Hervey, C I 40
Higgins, Chas H 40
Higgins, Herman K 40
Higgins, C M ..... —
Hildreth & Co 24
Hill, Jr, Nicholas S 40
Hinckley, J F 40
Hirschberg-Williams-Washburn Co 40
Hitner, H A Sons 44
Hodge Boiler Wks 10
Hogg, James B 40
Holmes, A L 17
Hough, Wm B Co ..... —
Hoyt, W A 40
Huber Mfg Co 28
Hudson, Clarence W 40
Hughes, W M 41
Hunt Co, C W 63
Hunt, Robt W & Co 24
Hyde Bros & Co 47
Hydrex Felt & Eng Co.... —
Hydro-Bar Waterproofing Co —

Independent Pneu Tool Co —
Indian Refining Co 71
Indianapolis Sw & F Co.... 32
Industrial Works 66
Ingersoll-Rand Co 27
Insley Mfg Co 64
Internat Acheson Graph Co 79
Internat Corres School .... —
Internat Creos & Const Co 71
Iowa Engineering Co 41
Iowa State College 24
Ironton Ptd Cement Co.... 73
Iroquois Iron Wks ..... —
Izzard-Warren Co 23

Jackson, Byron Jr, Wks.. 8
Janney, Steinmetz Co 71
Jeansville Iron Wks 5
Jeffrey Mfg Co 63
Jeffrey Co, The Thos B.. —
Johnson-Manville Co, H W —
Johnson & Fuller 41
Johnston, Robt 23
Johnston & Co, A W 41
Jones & Laughlin Steel Co 79
Journal Assoc Eng Soc 13

Kalamazoo Fdy & M Co.... 53
Keeler, E Co 8
Keith, Herbert C 41
Kellogg Co, M W 7
Kelly-Springfield Rd Rol Co 29
Kelsey, Duane J 30
Kennedy, Julian 41
Kennedy Valve Mfg Co 17
Kennicott Water Soft Co . 1
Kent Mill Co 73
Kenwood Bridge Co 78
Keuffel & Esser Co 30
Keystone Blue Paper Co .. 21
Keystone Driller & Pump Co 4
Keystone Driller Shops 27
Keystone Natl Powder Co. 31
Kilbourne & Jacobs Mfg Co 62
Kingsford F & M Wks 8
Kinnear Mfg Co 50
Knight & Hopkins 41
Koehring Mach Co 58
Kolesch & Co 22
Koppel Co, Arthur 32
Kosmos Port Cement Co .. 73
Kratzer, W N & Co ..... —

Labor Inf for Italians 44
Lackawanna Bridge Co 80
Lackawanna Steel Co 2
Ladd & Baker 41
Laidlaw-Dunn Gordon Co.. 26
Lambert Hoisting Eng Co. 60
Lamson Cons Store Serv. 62
Lancashire, Forest H 41
Landreth, Olin H 40
Lathbury, D'Oiler Co 51
Lawrence Cement Co 84
Lawrence Pump & Eng Co. —
Leadite Co 14
Ledder & Probst ..... —
Lederle & Provost 41
Leffel, James & Co..... 10
Lehigh Eng & Contrg Co. 24
Lehigh Valley Test Lab... 24
Leopold, J & Co 30
Leschen, A S Sons R Co.. 64
Lewis Institute 24
Lewis & Kitchen 53
Lidgerwood Mfg Co 60
Lietz, A & Co 22
Light, Heat & Power Co .. 41
Lima Loco & Mach Co. 23
Lincoln, E S 24
Link Belt Co 62
Lock Joint Pipe Co 16
Lombard Governor Co 10
Longenecker, Chas & Co .. 28
Loomis, T H 41
Loomis-Manning Filt Dis Co 1
Lucius, Albert 41
Ludlow, J L 41
Ludlow Valve Mfg Co 10
Lufkin Rule Co 23
Lultweiler Pump Eng Co . —
Lupton's Sons Co, David... —
Luten, Daniel B 74-41
Luther, J P Glove Co 22

Macdonald & Macdonald .. 24
Mack Bros Motor Car Co.. 51
Mack Pav & Const Co .. 46
Macomb Sewer Pipe Co .. 1
Main, Chas T 41
Males Co, The 47
Manitowoc Eng Wks Co.. 13
Marine Boiler Wks Co.... —
Marine Metal & Supply Co. 44
Marine Wreck Equip Co. —
Marion Steam Shovel Co .. 69
Marks, Wm D 41
Marquette Cem Co 84
Mason, W P 41
Massillon Br & Struc Co. 78
Massillon Ir & Steel Co .. 14
Maurer, Henry & Sons.... 52
Maury, Dabney H 41
McAvoy Vitrified Br Co .. 30
McClintic Marshall Con Co 82
McCormick Waterproof Ptd Cement Co 77
McConway & Torley Co . 32
McGowan, John H Co.... 7
McKelvey Machy Co 44
McKenna, Dr Chas 1
McKiernan-Terry Drill Co. 26
McLean, John 17
McMullen, Arthur & Co.... 76
McMyler Interstate Co .. 66
McNeil, James & Bro 15
McWane Pipe Wks 14
Meacham & Wright 72
Mead-Morrison Mfg Co.... 62
Mechanical Mfg Co 44
Meehan Boiler & Const Co. 12
Merrill Bros 50
Merritt & Co 53
Metcalf & Eddy 41
Metropolis Eng Co 41
Michigan School of Mines. 24
Michigan Pipe Co 15
Mietz, A 6
Millar, Chas & Son Co .. 15
Miller, Alex & Bro..... —
Miller & Francis Co 47
Milne Mfg Co 29
Milwaukee Bridge Co 78
Milwaukee Concrete Mixer & Machy Co 58
Minneapolis Steel & M Co. 79
Missouri Valley B & I Co.. 76
Mittineague Paper Co .... —
Mohler, Chas K 41
Monarch Valve & Mach Co 17
Monighan Mach Co 68
Monks-Ripley Pile Co..... 71
Monmouth M & Mfg Co.... 1
Monolith Steel Co 77
Montana State Sch of Mines 24
Morava Construction Co.... 78
Morgan Eng Co 41
Morris Co, I P 10
Morris Mach Wks 4
Morse, A J & Sons 71
Mt Vernon Bridge Co 78
Mundy, J S 60
Municipal Eng & Con Co.. 56

National Equip Co ..... —
National Fireproofing Co.. 52
Natl Hoisting Eng Co 62
Natl Mixer Co 53
Natl Meter Co 18
Natl Pav Br Mfrs Assoc.. —
Neptune Meter Co 18
New England Struc Co 76
New Era Gas Engine Co .. 6
New Orleans Wood P Wks. 71
N Y Cont Jewell Filt Co. 84
N Y Purch Agency 44
N Y Univ Sch of App Sci.. 24
Norbom Eng Co 67
Norfolk Creosoting Co 71
North Am Metaline Co 44
Northwestern Eng Corps.. 41
Northwestern University.. 24
Norwalk Iron Wks Co..... 36
Norwood Engineering Co . 10

Ohio Ceramic Eng Co 84
Oklahoma Ptd Cement Co. 73
Oliver Mfg Co, Wm J 53
Orenstein-A Koppel Co ... 33
Orton & Steinbrenner 66
O'Rourke Eng Const Co .. 76
Osgood Dredge Co 67
Ostrom, John N 41
Otto Gas Eng Wks..... 6
Owen Bucket Co ..... —
Owen, James 41

Pacific Flush Tank Co 51
Pacific Tank & Pipe Co... 15
Parker, A A 6
Parsons, G L Co 54
Patterson Co, W W 78
Pawling & Harnschfeger .. 66
Pels, Henry & Co 81
Pelton Water Wheel Co . 10
Penn Bridge Co 78
Penn Military College 24
Penna Cement Co 84
Penna Salt Mfg Co ..... —
Penna Steel Co 82
Petroleum Iron Wks 12
Pfister, Herman 22
Phoenix Bridge Co 81
Pierce, Arrow Co ..... —
Pierson, George S 41
Pitometer Co 50
Pittsburg Blk & Mfg Co... 78
Pittsburg Filter Co 17
Pittsburg Meter Co 18
Pittsburg Steel Prod Co... 48
Pittsburg Test Lab 24
Platt Iron Works, The.... —
Poole Eng & Mach Co 68
Porter Co, H K 33
Portland Wood Pipe Co .. 15
Potter, Alexander 41
Power & Min Mach Co ... 26
Power Speciality Co 12
Pressed Steel Car Co 32
Prescott, F M, Steam Co.. —
PROPOSALS ..51-54 Supp'm't
Puget Sound B Dredge Co. 67
Pulsometer Steam P Co .. 4
Purington Paving Br Co.. 30
Putman, H J C Co 22

Queen & Co 22

Rail Joint Co, The 32
Railway Steel Spring Co .. 1
Ramapo Iron Wks 34
Randolph, I 41
Ransome Conc Mach Co .. 67
Rapid Chimney Const Co. —
Rawson, Edward Lincoln.. 41
Raquette Fdy & Mach Co.. 52
Raymond Concrete Pile Co. 70
Raymond, W G 41
Redwood Mfrs Co.....1-15
Reinforced Con Pile Co .... —
Rensselaer Poly Inst 24
Reuter, C H ..... —
Riehle Bros Test Mach..73-8
Rife Hydraulic Eng Co .... —
Riggs & Sherman 41
Rinald Bros 1
Riter-Conley Mfg Co 81
Riverside Bridge Co 78
Roberts Filter Co 17
Roberts S H Boiler & Tank Co 13
Robins Conveying Belt Co. 63
Robins-Ripley Co 76
Robinson, A W 41
Robinson & Orr 47
Robinson & Wagner 41
Roebling Const Co 50
Roebling, John A & Sons Co 64
Rogers & Latimer 41
Rose Polytechnic Inst 24
Ross Valve Mfg Co 17
Roth Mfg Co ..... —
Rubberhide Co 24
Ruehle, E G & Co 22
Ruggles-Coles Eng Co 72

Safety Car Heat & Ltg Co. 32
Sandusky Ptd Cement Co. 72
San Francisco Bridge Co.. 76
Saunders, D Sons 16
Saylors Ptd Cement 73
Scaife, W B & Sons 78
Schalkenbach & Budke 76
Schrader's Sons, A 71
Schreiner Roll-Lift Br Co. 78
Schreiber & Sons Co, L.... 79
Scofield Eng Co 41
Sessions Fdy Co 16
Seyferts Sons, Inc, L F.... 44
Shankland, E C & R M.... 41
Sharon Boiler Wks 13
Shawmut Pav Car Wks .. 30
Sheffield School of Yale... 24
Shepard, E Crane & H Co. 66
Shoemaker, Louis F & Co 78
Sicilian Asphalt Pav Co... 30
Simplex Valve & Meter Co. 18
SITUATIONS WANTED ..42-43
Skene, Frederick 41
Smidth, F & L Co 72
Smith, A P Mfg Co 17
Smith Co, T L 1-59
Smith & Sons, Theo 67
Smith & Morgan Co 10
Snare & Triest 76
Snead Arch Iron Wks..... 78
Snyder, Hiram Co 84
Solomon-Norcross Co 41
Soltman, E G 21
Soopsmith, Chas 41
Soper, Geo A 41
Souther, John A & Co.... 68
Southern Creosoting Co .. 71
Southern Ir & Equip Co. 44
Southwark Fdy & M Co... 8
St George, H V ..... —
Standard Asphalt & R Co. 16
Standard Automatic Mfg Co ..... —
Standard Bridge Co 76
Standard C I Pipe & Fdy. 14
Standard Oil Co 80
Standard Paint Co 80
Standard Scale & Supply Co —
Star Drilling Mach Co .... —
Steel Railway Supply Co. 44
Stephens-Adamson Mfg Co. —
Steward & Romaine M Co. 82
Stone & Webster Eng Corp. 42

Stothoff Bros 25
Stow Mfg Co 25
Strauss Basc & Sons Br Co 78
Strobel Steel Cons Co 78
Stroudsburg Eng Wks 60
Stuebner Iron Wks, G L.. 38
Stupp Bros Bridge & Ir Co 76
Sturtevant, B F Co ..... —
Sullivan Machinery Co.... 26
Swenson, Emil 41

Talbot & Davidson 41
Taylor Iron & Steel Co 68
Taylor Instrument Co..... 22
Terry & Tench, Inc 68
Texas, The Co ..... —
Thew Auto Shovel Co 68
Thomas Elevator Co ..... —
Thomson Meter Co 18
Thorpe, Lewis D 41
Thorn Cement Co 72
Tippett & Wood 12
Titanium Alloy Mfg Co 34
Tod & Co, Wm 1
Toledo Bridge & Crane Co 76
Tolman Eng Co 41
Tomkins, Calvin 28
Treadwell Const Co 12
Trenton Iron Co ..... —
Tribus & Massa 41
Trojan Powder Co 25
Troy Pub Works Co 45
Truesdell-Fox Co 41
Trussed Con Steel Co 37
Tucker & Vinton 74
Tufts College 24
Turner, C A P 41
Turner Const Co 74
Turner, Willis T 41

Ulmer, J C & Co 21
Underwriters Lab 24
Union Iron Wks 70
United Engine & Con Co. 76
Universal Drafting Mach Co 21
Universal Road Mach Co.. 28
Univ Ptd Cement Co 84
University of Illinois 24
University of Vermont 20
U S Equipment Co ..... —
U S Cast Ir P & Fdy Co.. 14
U S Marine Signal Co..... —
U S Mineral Wool Co 1
U S Wind Eng & P Co.... 12
U S Wood Preserving Co... —

Vaile & Young 79
Van Nostrand D Co ..... —
Variety Ir & Steel Wks.. 70
Virginia Bridge & Ir Co.. 81
Vulcan Ir Wks (Chicago). 70
Vulcan Ir Wks (Wilkesb'e) 33
Vulcan Steam Shovel Co .. 69
Vulcanite Port Cement Co. 84

Waddell & Harrington ... 41
Waldron, Fred'k A 41
Walsh's Holyoke St Boil Co —
Want Advertisements and Situations Open 46, 47
Waring, Chapman & Farquhar 41
Warren City Tank & B Co. 13
Warren Fdy & Mach Co .. 14
Washington Pipe & Fdy Co. 15
Waterloo Cement Machy Co. —
Waterproofing Co ..... —
Watkins, Thomas ..... —
Watson-Stillman Co 25
Watson Wagon Co 53
Weber & Co, F 23
Weber Chimney Co 7
Webster Mfg Co ..... —
Wellman-Seaver-Morg E Co 6
West Tube Mill Co 73
Western Clay Prod-Pub Bur 19
Western Wheel Scrap Co.53-45
Westinghouse Air Brake Co. 11
Westinghouse El & M Co.. 11
Weston, E B 41
Weston, Robert Spurr 41
W Pascagoula Creo Wks .. 71
Wetherill, Robert 1
Wheeler, C H Mfg Co 50
Whipple, Geo C 40
White Co, J G 41
Whitehead & Kales Ir Wks. 78
Whiting Fdy Equip Co 1
Whitney, O R 44-47
Wiebusch & Hilger, Ltd.. —
Wiederholt Cons Co 7
Wiener, Ernst Co 53
Wiener Machy Co ..... —
Wiley, John & Sons 50
Wilkins Co, W G 41
Williams Co, G H 64
Williams, Brown & Earle.. 20
Williams Bros 25
Williamson Bros ..... —
Wilson, E H Co 44
Wilson, Harris & Richards. 41
Wing Co, L J 34
Wisconsin Br & Iron Co .. 81
Witstock, P & R 23
Wonham, Sanger & Bates.. 44
Wood Drill Wks 26
Wood, H S 41
Wood, R D & Co 7
Woodman, Andrew D 41
Worcester Poly Inst 24
Worden-Allen Co 80
Worthington, Henry R 4
Wragge & Fox 41
Wuerz & Co ..... —
Wyckoff & Son, Co, A .. 15
Wyckoff Pipe & Creos Co.. 71

Yale & Towne Mfg Co..... 63
Young, C G 41
Young, W W 41
Young & Sons 22
Youngstown Ir & St R Co. 81

Zeinicker, W A Supply Co. 47

H. S. ADAMS,
Civil Engineer.
Wharf and Dock Construction,
River and Harbor Works.
108-9 Ames Bldg., BOSTON, MASS.

AETNA ENGINEERING BUREAU,
Civil Engineers.
Surveys, Estimates, Valuations, Reports, Etc. Particular attention given to street pavements, sewerage and water supply systems. Surveys for steam and electric railways. Special assessment experts. Suite 709. Telephone, Franklin 898. 125 LaSalle Street, CHICAGO.

ALBANY SANITARY BUREAU,
ALBANY, N. Y.
Willis G Tucker, M. D., Ph. D., Chemist.
Olin H. Landreth, C. E., D. Sc., Engineer.
James H. Stoller, A.M., Ph.D., Bacteriologist.
Sanitary Experts.
Investigations and Reports on Water-Supply, Stream Pollution, Sewage Disposal, Sanitation of Buildings, Sanitary Improvement of Dairies,
Address the Secretary, Schenectady, N. Y.

OLIN H. LANDRETH,
M. Am. Soc. C. E.; M. Am. Soc. M. E.
Consulting Engineer.
For Hydraulic and Sanitary Works, Valuation for Investment, Condemnation and Indemnity.
Union College, SCHENECTADY, N. Y.

ALBRIGHT & MEBUS,
Civil and Sanitary Engineers.
Sewerage, Sewage Disposal, Townplanning.
908 Land Title Bldg., PHILADELPHIA.

JOHN W. ALVORD.
CHAS. B. BURDICK. Engineers. Consulting
Water Supply. Sewerage Water Power.
Hartford Bldg., CHICAGO.

AMERICAN ENGINEERING CORPORATION,
C. E. Grunsky, President.
All Branches of Engineering.
Mechanics' Institute Bldg.,
SAN FRANCISCO, CAL.

BION J. ARNOLD,
M. Am. Inst. E. E., Consult. Elec. Eng.
Electric Railways, Power Stations and Transmission Plants. 154 Nassau St.,
Borland Block, CHICAGO. NEW YORK.

THE ARNOLD COMPANY,
Engineers, Constructors.
Electrical, Civil, Mechanical.
181 La Salle St., CHICAGO.

R. FLEMING ARNOTT,
Assoc. M. Am. Soc. C. E.
Assoc. M. Inst. C. E.
Consulting Engineer.
Specialties: Mechanical and Railroad Engineering. Plans, Estimates, Inspection and Reports. Tel. 5396 Cortlandt.
95-97 Liberty St., NEW YORK.

JEAN BART BALCOMB,
Hydraulic Engineer.
Examinations, reports, valuations, irrigation and drainage, water-works and sewer systems, power propositions, concrete work.
1208 Title and Trust Bldg., CHICAGO.

F. A. BARBOUR,
Civil and Sanitary Engineer.
Specialties: Water Supply from a Sanitary Standpoint and Sewage Disposal. Mechanical Analyses of Sands.
Tremont, Bldg., BOSTON, MASS.

VIRGIL G. BOGUE,
Consulting Engineer.
Railways, Bridges, Terminals, Tunnels, Subways, Harbors, Wharves, Docks, Etc.
Expert Examinations and Reports.

ALBERT WELLS BUEL,
Civil and Consulting Engineer.
Bridges, Substructures, Masonry, Reinforced Concrete, Designs, Fabrication, Erection.
15 William Street, NEW YORK, N. Y.

DANIEL BONTECOU,
M. Am. Soc. C. E., Civil Engineer.
Railroads, Bridges, Power Plants, Examinations and Reports.
406 Dwight Bldg.,
KANSAS CITY, MO.

ALLEN R. BOUDINOT,
Civil Engineer.
Municipal Improvements,
Rural Property Development.
239 Masonic Temple, DAVENPORT, IOWA.

AUSTIN LORD BOWMAN,
M. Am. Soc. C. E., M. Am. Soc. M. E.
Consulting Engineer.
Railroads, Bridges, General Structural Work, Reports, Plans, Estimates, Superintendence. Telephone, 3431 Cortlandt.
Rooms 2611-2612, 165 Broadway,
NEW YORK.

OSCAR H. BRIGGS,
Coffer-Dam Construction. Estimates, construction and maintenance of coffer-dams on all classes of hydraulic work. Specialty, water powers.
75 Westminster St., PROVIDENCE, R. I.

JAMES L. BROWNLEE,
Member Am. Soc. C. E.
Consulting and Civil Engineer.
Railway Location and Construction. Water Front Improvements, Docks, Foundations, etc. Telephone 4094 Cortlandt.
114 Liberty St., NEW YORK.

WILLIAM H. BRYAN,
M. Am. Soc. M. E.
Water-Works, Electric Light and Power, Heating, Ventilating, Examinations, Tests, Reports.
418-9 Title Guaranty Bldg., ST. LOUIS, MO.

JAMES M. CAIRD,
Chemist and Bacteriologist.
Water Analysis and Methods of Filtration a Specialty.
271 River St., TROY, N. Y.

CAMERON SEPTIC TANK CO.,
Consulting Engineers.
Sewage Disposal.
Sole owner of U. S. Patent covering the Septic Process.
352 Monadnock Block, CHICAGO, ILL.

CHESTER & FLEMING,
Hydraulic, Sanitary & Mechanical Engineers.
Union Bank Bldg., PITTSBURG, PA.

CITY-WASTES DISPOSAL CO.,
(Organized from the Staff of the late Col. Geo. E. Waring, Jr.)
Consulting and Contracting in Sewerage, Sewage Disposal, Garbage and Refuse Disposal and Street Cleaning.
156 Fifth Ave., NEW YORK.

J. A. COLBY,
Inspection of Steel for Bridges, Buildings and Track Materials.
Witherspoon Bldg., PHILADELPHIA, PA.

JOHN A. COLE & EDW. S. COLE,
M. Am. Soc. C. E. M. Am. Soc. M. E.
Engineers for Water Works.
220 Broadway, NEW YORK.

CHAS. E. COLLINS,
Assoc. M. Am. Soc. C. E.
Consulting Engineer on Water Power, Water Supply, Sewerage and Sewage Disposal
Drexel Building, PHILADELPHIA, PA.

CONDRON & SINKS,
Civil Engineers.
Members Am. Soc. C. E.
Bridges, Buildings and Foundations.
Structural Steel and Reinforced Concrete.
1214 Monadnock Building, CHICAGO.

OSBORN CONGELTON,
Consulting Sanitary Engineer.
Sewage Disposal and Water Filtration.
Sole owner of Congelton Process.
For the benefit of the profession.
37 East 28th St., NEW YORK.

CONKLING & BOARDMAN,
Consulting Civil Engineers.
C. C. Conkling, M. Am. Soc. C. E.
C. S. Boardman, M. Am. Soc. C. E.
Surveys, Plans and Reports; Water Front Improvements, Foundations, Railroads, Water Supply, Sewerage.
Ellicott Square, BUFFALO, N. Y.

Hugh L. Cooper. W. V. N. Powelson.

COOPER & POWELSON,
Consulting Engineers and Managers.
Hydraulic, steam and electric power plants. Electric transmission lines and distributing systems.
60 Wall St., NEW YORK.

CHAS. GOBRECHT-DARRACH,
Mem. Am. Soc. C. E., etc., etc.
Consulting Engineer.
Water Supply and Purification, Sewage Disposal, Examinations for Investments, Railroads, Hydraulic Work, etc., etc.
MOUNT VERNON, SKAGIT CO., WASH.

DOW & SMITH,
Chemical Engineers,
Consulting Paving Engineers,
A. W. Dow, Ph. B., F. P. Smith, Ph. B.,
M. Am. Inst. Ch. Engrs. M. Am. Soc. C. E.
Asphalt, Bitumens, Paving, Hydraulic Cements, Engineering Materials.
24-26 East 21st St. NEW YORK, N. Y.

A. L. DRUM & CO.,
Consulting and Constructing Engineers.
Electric Railway, Power and Transmission Systems. Physical and Financial Reports.
American Trust Bldg., CHICAGO.

SAMUEL E. DUFF.
Consulting Engineer.
Specialty: The design of machinery and complete plants for the fabrication of structural steel.
Empire Building, PITTSBURG, PA.

H. F. DUNHAM,
Consulting Civil Engineer.
220 Broadway (St. Paul Bldg.), NEW YORK.

EAST ST. LOUIS ENGG. CO.,
Municipal, Drainage, Irrigation and Railroad Engineering.
Cahokia Bldg., EAST ST. LOUIS, ILL.

S. E. FAIRCHILD, JR.,
Civil and Mining Engineer. Reports on Mining Properties. Specialty, Coal Lands. Rapid Stadia Surveys for all kinds of development. Franklin Bldg., 133 South 12th St., PHILADELPHIA.

J. T. FANNING,
Consulting Engineer, M. Am. Soc. C. E.
Plans for Public Water Supplies, Steam and Hydraulic Powers, Electric and Power Transmission.
330 Hennepin Ave., MINNEAPOLIS, MINN.

JOHN M. FARLEY,
Consulting Engineer, M. Am. Soc. C. E.
Water-Works, Sewerage and Sewage Disposal. Examinations and Reports.
527 Fifth Ave., NEW YORK.

FAYETTE ENGINEERING CO.,
Civil, Mining and Consulting Engineers.
Herbert M. Crawford.
L. C. Mechling.
E. L. Zearley.
Specialties: Construction of Coal and Coke Plants and the Development of Coal Properties. UNIONTOWN, PA.

WILLIAM P. FIELD,
Civil Engineer.
Foundations, Roofs, Buildings, Bridges, Railways and Railway Structures.
Prudential Bldg., Broad, cor. Bank St.,
NEWARK, N. J.

EDWARD FLAD & CO.,
Engineers.
Civil—Mechanical—Electrical.
Industrial Buildings, Water-Works, Sewerage, Irrigation, Drainage, Railways, Power Plants, Valuation and Investment Reports, etc.
Fullerton Building, ST. LOUIS.

CHAS. EVAN FOWLER,
M. Am. Soc. C. E., M. Can. Soc. C. E.
Consulting Civil Engineer.
Bridges, Structures, Foundations, River and Harbor Improvements.
501 Central Bldg.,
SEATTLE, WASHINGTON, U. S. A.

FOX AND PECK,
Civil and Mining Engineers.
Twenty years' experience in the coal fields of Virginia, Kentucky and Tennessee.
BIG STONE GAP, VA. HARLAN, KY.

ALBERT I. FRYE, M. Am. Soc. C. E.
Consulting Engineer.
Expert Examinations and Reports.
Railways, Structures, Hydraulics.
90 West St. (West St. Bldg.), NEW YORK.

FULLER & MANLEY,
Engineers.
515-16-17-18-19 Savage-Scofield Bldg.,
TACOMA, WASH.

JAMES H. FUERTES,
M. Am. Soc. C. E.
Civil and Sanitary Engineer.
Water Supply and Water Purification.
Sewerage and Sewage Disposal.
140 Nassau St., NEW YORK.

FRANK L. FULLER,
Civil and Hydraulic Engr., M. Am. Soc. C. E.
Special Attention Given to Water Supply and Sewerage.
12 Pearl St., BOSTON, MASS.

CARL GAYLER,
Consulting and Designing Engineer.
Bridges, Buildings and Foundations.
Wainwright Bldg., ST. LOUIS, MO.

GILBERT H. GILBERT,
Submarine Drilling, Dredging and Contractors' Machinery Designed. Supervision and Direction of Canal, River, Harbor or Reclamation Construction. Address
154 West 57th St., NEW YORK.

SAMUEL M. GRAY,
Consulting Engineer for Municipal and Sanitary Work.
Room 929 Banigan Building,
10 Weybosset St., PROVIDENCE, R. I.

CHAS. A. HASKIN,
Contracting Engineer.
Exclusive attention given to difficult construction of Shafts and Tunnels in Quicksand and other Water-bearing materials.
Consultation, Plans and Estimates.
16 City Square, Charlestown Dist.,
BOSTON, MASS.

T. CHALKLEY HATTON,
M. Am. Soc. C. E., Consulting Engineer.
Examinations, Surveys and Reports made, Plans and Specifications prepared and Construction Superintended for Proposed Systems of Water Supply, Drainage, Sewerage and Sewage Disposal and Improved Street Pavements.
WILMINGTON, DEL.

Allen Hazen and George C. Whipple,
Consulting Engineers for Water Supply and Sewage Disposal, particularly from the sanitary standpoint and with reference to purification.
103 Park Ave., NEW YORK.

HAZLEHURST & ANDERSON,
Consulting Municipal Engineers.
James Nisbet Hazlehurst,
Chas. L. B. Anderson.
Candler Bldg., ATLANTA, GA.

Ira G. Hedrick Victor H. Cochrane
HEDRICK & COCHRANE,
Consulting Engineers.
Steel and Reinforced Concrete Bridges, Viaducts, and Buildings; Elevated Railways, Railroads, Interurban Railways and Railroad Terminals, Borings and Foundations. Estimates of Cost, Investigations, Valuations and Reports.
1118 McGee Street, KANSAS CITY, MO.

AUGUSTUS C. HEPP, C. E.
Consulting Sanitary Engineer.
Water Supply—Sewerage—Sewage Disposal—Expert Examination of Sewage Disposal Propositions and Systems.
143 Liberty Street. NEW YORK CITY.

Rudolph Hering & George W. Fuller,
Hydraulic Engineers and Sanitary Experts.
RUDOLPH HERING,
M. Am. Soc. C. E.; M. Inst. C. E.; M. Can. Soc. C. E.
GEORGE W. FULLER,
Mem. Am. Soc. C. E.
Water Supply, Water Purification, Sewerage and Sewage Disposal.
Broadway-Maiden Lane Bldg., 170 Broadway, NEW YORK.

C. L. HERVEY,
M. Can. Soc. C. E.
Consulting Engineer.
Railroad surveys, estimates and construction. Property development, valuations and reports. Engineering for contractors, construction, organization and superintendence.
400 St. James St.,
MONTREAL, QUE.

CHARLES HOUCHIN HIGGINS,
Assoc. M. Am. Soc. C. E.
Constructing and Consulting Engineer.
Buildings, Foundations, Docks, Etc.
Commercial Trust Bldg., JERSEY CITY.

HERMAN K. HIGGINS,
Assoc. M. Am. Soc. C. E.
Designs, Examinations, Reports, Dredging, Transportation, Construction, Drainage, Water Supply, Power, etc.
1105 Exchange Bldg., BOSTON, MASS.

NICHOLAS S. HILL, JR.,
Consulting Engineer,
100 William Street,
NEW YORK CITY.
Water Supply and Sewage Disposal.
Evaluations and Reports.

Laboratory
for
Analysis of Water and Sewage
and for
Testing Cement, Sands, Coal and Metals.

Steam and Hydraulic Power Plants.

J. F. HINCKLEY,
M. Am. Soc. C. E.
Member A. R. E. & M. of W. Assn.
Civil and Consulting Engineer.
Particular attention given to Railway Surveys, Construction, Examination and Reports.
Suite 1423-4-5 Syndicate Trust Bldg.,
Telph.—Olive 1485. ST. LOUIS.

HIRSCHBERG-WILLIAMS-WASHBURN CO.,
Civil Engineers.
Buildings, Bridges, Foundations, Reinforced Concrete, Steam and Electric Railway Surveys, Superintendence and Inspection, Estimates and Reports.
410-413 Stephenson Building,
MILWAUKEE, WIS.

JAMES B. HOGG,
M. Am. Soc. C. E.
Civil and Mining Engineer.
Municipal Improvements, Water Power Development, Reinforced Concrete Structures, Railroad Location, Development of Coal Properties, Examinations, Reports and Design.
828 Park Bldg., PITTSBURG, PA.

W. A. HOYT,
M. Am. Soc. C. E.
Reinforced Concrete Specialist.
455 Old Colony Bldg., CHICAGO.

CLARENCE W. HUDSON,
Consulting Engineer.
Designs, Estimates and Reports for Bridge and Structural Work.
45 Broadway, NEW YORK.

W. M. HUGHES,
M. Am. Soc. C. E.
Consulting Engineer.
Plans, Specifications, Estimates, Supervision Bridges, Steel, Masonry and Reinforced Concrete Construction. Examinations and Reports. Licensee for the Page Bascule Bridge.
532 Postal Telegraph Bldg., CHICAGO.

IOWA ENGINEERING CO.,
Civil, Hydraulic and Sanitary Engineers.
Chas. P. Chase, Mgr.
Specialties—Water-Works, Sewerage and Sewage Disposal. CLINTON, IOWA.

JOHNSON & FULLER,
Consulting Engineers for Water Supply, Sewerage, Sewage and Refuse Disposal, Reports for Water and Sewage Purification. Preliminary Investigations, Designs and Supervision of Construction. Specialists on Efficient and Economical Operation of Water and Sewage Purification Works.
George A. Johnson, Wm. B. Fuller,
Assoc. M. Am. Soc. C. E. M. Am. Soc. C. E.
150 Nassau St., NEW YORK.

A. W. JOHNSTON & CO.,
Electrical Engineers,
The faculties for successfully handling technical problems, Plans, Contracts, Specifications.
Troy, NEW YORK.

HERBERT C. KEITH,
Mem. Am. Soc. C. E.
Design and Construction of
Bridge and Structural Work,
Masonry and Foundations,
Railroads and Street Railways.
Inspection and Valuation of Existing Structures.
Legal Engineering.
116 Nassau St., NEW YORK.

JULIAN KENNEDY,
Engineer.
Cable Address "Engineer, Pittsburg."
PITTSBURG, PA., U. S. A.

KNIGHT & HOPKINS,
Charles W. Knight, C. E.
Chas. C. Hopkins, M. Am. Soc. C. E.
Sanitary and Hydraulic Engineering a Specialty. Designs, Specifications, Estimates and Reports for Water-Works and Sewerage. Construction Superintended. Correspondence Solicited. ROME, N. Y.

LADD & BAKER, INC.
Consulting and Contracting Engineers.
Mutual Life Ins. Co.'s Bldg.,
1011 Chestnut St., PHILADELPHIA, PA.

FOREST H. LANCASHIRE,
Assoc. Mem. A. S. C. E.
Fred. A. Long, Prin. Asst.
Designing and Constructing Engineer.
Surveys and Reports. Public Utility. Properties Operated on Income Guarantee Basis.
Specialties: Municipal Engineering, Sewer and Water Systems, Railway and Lighting Systems, Work in Spanish America.
Suite No. 842 Wilson Bldg. DALLAS, TEX.

LEDERLE & PROVOST,
Sanitary Experts and Hydraulic Engineers.
Water Supply, Sewage Purification.
Lederle Laboratories Associated.
39-41 West 38th St. NEW YORK CITY.

THE LIGHT, HEAT & POWER CORP'N, BOSTON,
Contracting Engineer.
Electric Light and High Pressure Gas Plants
131 State St BOSTON, MASSACHUSETTS.
Cable Address "Lihepowco" Code—Lieber's

T. H. LOOMIS,
Civil Engineer.
Member Am. Society Civil Engineers and Am. Society of Engineering Contractors.
STEUBENVILLE, OHIO.

J. L. LUDLOW, M. Am. Soc. C. E.
Consulting Engineer.
Water Supplies and Sewerage, Water Purification and Sewage Disposal, Electric Railways and Lighting, Water Powers, Hydro-Electric and Steam Power Plants; Studies, Plans, Appraisals. Physical and Financial Reports on Public Utilities and Industrial Plants in Southern States. Advice in Municipal Sanitation. Interviews by appointment in Eastern Cities. WINSTON-SALEM, N. C.

ALBERT LUCIUS,
Civil and Mechanical Engineer.
All kinds of Engineering Structures. Plans, Specifications, Estimates, Superintendence.
38 Park Row, NEW YORK.

DANIEL B. LUTEN,
Designing and Consulting Engineer,
Reinforced Concrete Bridges.
Over 3,500 erected.
Associate Engineers in all States.
INDIANAPOLIS.

CHARLES T. MAIN,
M. Am. Soc. M. E.
Plans and specifications for textile mills and other industrial plants, water power and steam power development. Examinations and reports on plants with reference to their value, reorganization or development.
201 Devonshire Street, BOSTON, MASS.

WILLIAM D. MARKS, Ph. B., C. E.
Consulting Engineer and Statistician.
Electric Railways. Oil Motor Cars.
Gas Works. Electric Lighting Stations.
Offices, 623-624 Park Row Bldg., NEW YORK

WM. P. MASON,
Sanitary Expert, Water Analysis.
Examinations of, and Reports upon, proposed sources of Water Supply.
Rensselaer Polytechnic Institute, TROY, N. Y.

DABNEY H. MAURY,
M. Am Soc. C. E., M. Am. Soc. M. E.,
Consulting Engineer.
Water-Works, Increase of Water Supply
Appraisals, PEORIA, ILL.

METCALF & EDDY,
Members Am. Soc. C. E.
Consulting Engineers on Water Supply.
Water Power, Sewerage and Sewage Disposal
14 Beacon St., BOSTON, MASS.

METROPOLIS ENGINEERING CO.,
Civil Engineers.
Surveys, Examinations, Reports, Plans, Specifications, Superintendence, Construction.
359 Fulton St., JAMAICA, N. Y.

CHARLES K. MOHLER,
Consulting and Designing Engineer.
Traffic and Transportation Reports, Steam and Electric Railway Valuations. Specialist on "Stability and Economy" in Abutment and Retaining Wall Design.
Loop Protective & Improvement Assn. Engr.
McCormick Building, CHICAGO.

MORGAN ENGINEERING CO.,
Arthur E. Morgan. L. L. Hidinger.
Drainage Engineering.
612 Goodwyn Institute Bldg.,
MEMPHIS, TENN.

THE NORTHWESTERN ENGINEERING CORPORATION,
Engineers and Constructors.
F. S. Sawyer, D. H. Sawyer, White Bldg., Seattle, Wash.; W. H. Graves, G. L. Sawyer, Lindelle Black, Spokane, Wash.; Wells-Fargo Bldg., Portland, Ore.
Irrigation, Water Power Development, Water-Works, Sewer Systems, Railroads and Logging Roads.
Specialties: Reports on Irrigation Projects and Water Power Development.

JOHN N. OSTROM, C. E.,
M. Am. Soc. C. E.; M. Western Soc. Engrs.
Bridge Engineer.
Specifications, Strain Sheets, Estimates, Details, Bridges and Other Framed Structures. Tests and Inspection. Mill and Shop Material. Field Erection. Expert Examination of and Plans for Strengthening Old Superstructure and Substructure. Soundings, Borings, Surveys, Foundations.
2320 Farmers' Bank Bldg., PITTSBURG, PA.

JAMES OWEN,
M. Am. Soc. C. E., Civil & Consulting Engr.
196 Market St., NEWARK, N. J.

GEO. S. PIERSON,
M. Am. Soc. C. E.
Sewers, Sewage Disposal, Water-Works, Water Power, Pavement, Concrete Work.
KALAMAZOO, MICH.

ALEXANDER POTTER, C. E.
Hydraulics.
Sanitation.
Concrete Structures.
Designed - Financed - Executed.
114 Liberty St., NEW YORK.
Tel. 7848 Cort.

ISHAM RANDOLPH,
Consulting Engineer.
Member American Society of Civil Engineers, Member Western Society of Engineers.
First National Bank Bldg., CHICAGO.

EDWARD LINCOLN RAWSON,
Architect and Engineer.
Building Superintendence, Wharf and Dock Construction, Consulting and Concrete.
6 Beacon Street, BOSTON, MASS.

WM. G. RAYMOND,
Consulting Civil Engineer.
Railway Location, Water Supply, Examinations and Reports.
IOWA CITY, IOWA.

THE RIGGS & SHERMAN CO.,
Consulting Engineers.
H. E. Riggs. W. J. Sherman.
Water-Works, Investment Reports, Sewerage and Paving, Steam and Electric Railways, Appraisals.
613 The Nasby, TOLEDO, OHIO.

A. W. ROBINSON,
M. Am. Soc. C. E., M. Am. Soc. M. E.,
Mechanical Engineer.
Dredging Machinery of every type designed for special conditions.
Plant for Public Work, Gold Dredges.
Cable Address, "Dredge, Montreal."
Long Distance Telephone, Uptown 2478.
14 Phillips Square, MONTREAL, CANADA.

ROBINSON & WAGNER,
Experts in Sewage Disposal.
37-39 East 28th Street, NEW YORK.

Geo. H. Rogers. Lewis S. Latimer.
ROGERS & LATIMER,
Civil and Electrical Engineers.
Surveys, Reports, Plans and Estimates for Water Supply, Sewage Disposal, Railroads, Property Development, Municipal Construction. Tel. 6828 38th.
5 East 42d St., NEW YORK.

SCOFIELD ENGINEERING CO.,
Consulting Engineers.
Power Stations. Electric Railways
Hydraulic Developments. Material Handling.
PHILADELPHIA.

E. C. & R. M. SHANKLAND,
Civil Engineers.
Steel and Reinforced Concrete Building Construction. Foundations. Examinations and reports.
The Rookery, CHICAGO, ILL.

FREDERICK SKENE, C. E.,
Consulting Engineer.
Water Works, Sewage Disposal and Pavements. General engineering work.
Singer Bldg., 149 Broadway, NEW YORK.

SOLOMON-NORCROSS CO.,
Civil Engineers.
Steel Construction. Reinforced Concrete. Water Supply, Sewerage, Power Plants and Dams. 1623 Candler Bldg., ATLANTA, GA.

CHARLES SOOYSMITH,
Consulting Engineer.
Telephone, 43 Rector.
71 Broadway, NEW YORK CITY.

GEORGE A. SOPER, Ph. D.,
M. Am. Soc. C. E., Consulting Sanitary Engr.
Telephone, 42 Rector.
17 Battery Place, NEW YORK.

STONE & WEBSTER ENGINEERING CORPORATION,
Constructing Engineers.
BOSTON, MASS.

EMIL SWENSSON, C. E.,
M. Am. Soc. C. E.
Consulting and Constructing Engineer.
Steel Bridges, Elevated Roads, Piers, Docks, Bins, Office and Mill Buildings, etc. Manufacturing Plants, Steam and Electric Railways, Rapid Transit Systems, Terminals and Foundations from Survey to Completion. Examinations, Valuations and Reports for Investment. Frick Bldg., PITTSBURG, PA.

TALBOT & DAVISON.
A. Mem. Inst. M. E., Mem. Inst. Auto. E. Eng.
Consulting Engineers and Draftsmen.
Experts in Automobile Design, Construction and Inspection.
34 West 61st St., NEW YORK CITY.

LEWIS D. THORPE.
Civil and Sanitary Engineer
Water Supply, Sewerage and Sewage Disposal.
201 Devonshire St., BOSTON, MASS.
(Successor of the late Freeman C. Coffin.)

TOLMAN ENGINEERING CO.,
Civil Engineers.
General practice in Texas, Mexico and the Southwest
403 First National Bank Building,
HOUSTON, TEXAS.

TRIBUS & MASSA,
Civil and Hydraulic Engineers.
Louis L. Tribus, Charles R. Bettes.
Charles G. Massa. J. T. Fetherston.
Water Supply, Sewerage, Water Power, City Refuse. Reports for Banking Houses.
86 Warren St., NEW YORK.

TRUESDELL-FOX COMPANY,
Structural Steel, Power and Industrial Plants, Reinforced Concrete, Consultation, Reports, Estimates.
7 West 38th St., NEW YORK.

C. A. P. TURNER,
M. Am. Soc. C. E., Consulting Engineer.
Reinforced Concrete and Structural Steel Bridges, Buildings and Manufacturing Plants.
Suite 816 Phoenix Building.
MINNEAPOLIS, MINN.

WILLIS T. TURNER,
Assoc. M. Am. Soc. C. E.
Water Supply, Irrigation and Drainage.
Plans, Estimates and Specifications.
Spanish spoken.
ST. PETERSBURG, FLORIDA.

J. A. L. Waddell. John Lyle Harrington.
WADDELL & HARRINGTON.
Consulting Engineers.
Bridges, Elevated Railways, Steel Buildings, Roofs, Foundations, Designs, Specifications, Estimates, Examinations, Valuations and Reports.
1012 Baltimore Ave., KANSAS CITY, MO.

FREDERICK A. WALDRON,
Industrial Engineer.
Reports, Factory Economy, Factory Design, Power Plants.
37 Wall St., NEW YORK.

WARING, CHAPMAN & FARQUHAR
Specialty, Sanitary Engineering.
Examinations, Surveys, Plans, Specifications, Estimates and Supervision.
Sewerage, Sewage Disposal, Drainage, etc.
874 Broadway, NEW YORK, N. Y.

EDMUND B. WESTON,
M. Am. Soc. C. E., M. Inst. C. E. Consulting Engineer. Water Supply, Filtration, Sewerage, Fire Protection, etc. 86 Weybosset St., PROVIDENCE, R. I.

ROBERT SPURR WESTON,
Consulting Engineer for Water Purification and Sewage Disposal.
Hygienic Analyses.
14 Beacon St., BOSTON, MASS.

J. G. WHITE & CO., Incorporated.
Engineers, Contractors.
43-49 Exchange Place, New York.
First Nat'l Bank Bldg., Chicago.
Alaska Commercial Bldg., San Francisco.
London Correspondents:
J. G. White & Co., Ltd.,
9 Cloak Lane, Cannon St., E. C.
Principal Philippine Office, Manila, P. I.

THE W. G. WILKINS COMPANY,
Engineers and Architects.
Railroad Location, Foundations, Buildings, Bridges, Coal and Coke Plants, Water-Works and Sewerage. Examinations and Reports.
Branch Office, Huntington, W. Va.
Westinghouse Bldg., PITTSBURG, PA.

WILSON, HARRIS & RICHARDS,
Architects and Consulting Engineers.
Successors to Wilson Bros. & Co.
Drexel Bldg., PHILADELPHIA, PA.

Colin R. Wise. Robert M. Watson.
WISE & WATSON,
Civil and Sanitary Engineers.
Sewerage and Sewage Disposal, Water-Works and Municipal Engineering.
34 Bloomfield Ave., PASSAIC, N. J.

H. S. WOOD,
M. Am. Soc. C. E. & M. Am. Soc. M. E.
Consulting and Purchasing Engineer.
Suction and Gas Power Dredges, Land Reclamation, Centrifugal Pumping Plants, Steel Work and Harbor Improvements.
1825 Park Row Building, N. Y. CITY.

ANDREW W. WOODMAN,
M. Am. Soc. C. E.
Building Construction.
Examinations. Reports.
Management.
108 La Salle St., CHICAGO.

WRAGGE & FOX,
M. M. Can. Soc. C. E.
Reports, Designs, Estimates, Supervision of Construction, etc. Representatives of SIR DOUGLAS FOX & PARTNERS, London.
613 Traders' Bank Building,
TORONTO, CANADA.

C. G. YOUNG,
Engineering and Construction. Sixty
Plans, Methods, Operation. Wall St.,
Reports for Financing. NEW YORK.

W. W. YOUNG,
Consulting Engineer.
Examinations, Estimates, Financial and Engineering Reports. Box 199 Gen. P. O.
St. Paul Bldg., NEW YORK.

WRITE FOR RATES

for cards ½, ¾, 1 inch and over.

These pages are changed on the first of each month, and to insure insertion copy should be in our hands by the fifteenth of the month previous.

SITUATIONS WANTED

Cards under this head are inserted in uniform style, in solid type, at 1½ cents a word; single leaded, 2 cents a word; double leaded, 2½ cents a word (address to be counted in every case). Minimum charge, 25 cents. Special display arrangement of matter, $1.50 an inch. Cash MUST accompany the order in all cases. Copy should reach us not later than Tuesday noon.

Mechanical and Electrical Engineers.

MECHANICAL ENGINEER (33), experienced as estimator, engineer or manager on structural steel, boilers, tanks, castings, general machinery, sugar machinery, acid plants, smelter work and construction work; open for engagement. Address "C. B. 17," Engineering News, New York. 17-12t

MECHANICAL ENGINEER, technical graduate, four years' broad experience, desires position with consulting engineer, in or near New York. Address "O. 20," Engineering News, New York. 23-4t

SUPERINTENDENT, mechanical engineer, 12 years' experience river, harbor and canal dredging as designer, constructor and superintendent. Address "B. A. 25," Engineering News, New York. 25-2t

MECHANICAL ENGINEER, University graduate, twelve years' experience; ten years executive in charge of sales and manufacturing; at present employed, but will consider good opening in either department; any location. Give full details, including salary. Address "D. A. 25," Engineering News, New York. 25-2t

UNIVERSITY C. E., '07, experienced designer of steel and machinery, excellent draftsman, desires position; location immaterial. Address "K. A. 25," Engineering News, New York. 25-3t

MECHANICAL and Chemical Engineer, 18 years' experience, expert conveying, hoisting and transmission machinery; steel, concrete and timber construction, foundry and machine shop practice, desires position as consulting, chief or estimating engineer or other engineering position where knowledge, integrity, ability and sound judgment is demanded. Salary must be liberal. Address "A. A. 24," Engineering News, New York. 26-1t

DESIGNING and constructing engineer (36), married; hydro-electric development preferred; will go anywhere. Address "H. 26," Engineering News, New York. 26-4t

MECHANICAL ENGINEER; 7 years' experience in conveying machinery and grab bucket design, desires change in position. Address "Q. 26," Engineering News, 1636 Monadnock Block, Chicago. 26-1t

MECHANICAL ENGINEER (30), technical school and ten years' experience in mechanical and civil engineering and building construction, desires permanent position. Competent to take entire charge of work. Address "H. 19," Engineering News, New York. 26-2t

Civil Engineers.

CIVIL ENGINEER, with fifteen years' experience in field, office and construction work, will be open for engagement as locating engineer or engineer and superintendent of construction, electric railway, highway and park work preferred. Address "C. A. 22," Engineering News, New York. 22-tf

CIVIL ENGINEER, long practical experience, wishes position as superintendent of reinforced concrete construction or inspector. Address "Z. 15," Engineering News, New York. 15-12t

ENGINEER, wide experience, surveys and construction; open for proposition; go anywhere at once. Address "A. 16," Engineering News, New York. 16-12t

CONTRACTOR'S ENGINEER in New York desires important position with progressive firm, age 33, graduate, experienced all classes buildings, docks, dredging, bridges, industrial plants; a hustler; good executive. Address "R. B. 17," Engineering News, New York. 17-tf

GRADUATE ENGINEER (32), general executive experience, estimating, design, construction, maintenance, industrial plants, reinforced concrete, structural steel, installation machinery. Address "G. A. 19," Engineering News, New York. 19-12t

GRADUATE CIVIL ENGINEER (27), four years' experience; surveying and mill engineering; good draftsman; at present engineer for paper mill; wishes position in western Canada. Address "F. A. 21," Engineering News, New York. 21-12t

CIVIL ENGINEER, graduate, five years' experience, water-power development, building construction, difficult foundations, reinforced concrete, cost analysis and estimating, tropical experience; references; go anywhere, but prefer the South, the Southwest or the tropics. Address "D. 19," Engineering News, New York. 19-12t

GRADUATE C. E. (32), ten years' experience, maintenance, right of way and construction departments, desires position with progressive firm. Address "D. 24," Engineering News, New York. 24-3t

GRADUATE CIVIL ENGINEER (30), nine years' experience on railway, irrigation and general construction work, desires change for other than financial reasons; now engaged in private practice in Rocky Mountain region. Have been in responsible charge of all classes of irrigation work, including surveys, designs and construction. General construction work includes one year's experience on reinforced concrete as superintendent of construction by day labor. Address "Q. 22," Engineering News, 1636 Monadnock Block, Chicago. 22-7t

CIVIL ENGINEER, Assoc. M. A. Soc. C. E., wishes responsible position in railroad or industrial development; 10 years' practical experience in office and field; 4 in M. of W. Dept., location and construction; 5 in design of bridge and industrial buildings; one year designer and superintendent of construction on bridges and bridge substructure; plane and reinforced; age 32, single; salary, $175; report on reasonable notice. Address "B. 18," Engineering News, New York. 18-tf

CIVIL ENGINEER, Assoc. M. A. Soc. C. E., college graduate, eleven years' experience in field, office and construction work; experienced in subway, tunnel and railroad construction, open for engagement, resident engineer or superintendent. Address "M. 23," Engineering News, New York. 23-12t

CONSTRUCTION ENGINEER, several years' experience on heavy construction, foundations, concrete, dredging and plant design for same. Address "L. A. 23," Engineering News, New York. 23-4t

PLANT DESIGNER, civil engineer and superintendent; has designed and operated many successful plants. Specialty of concrete and hydraulic dredging; present employed. References. Address "H. A. 23," Engineering News, New York. 23-4t

CONSTRUCTION ENGINEER, Member W. S. E., with 15 years' experience on railroad construction, heavy concrete work, drainage; capable of handling construction work; reliable, with temperate habits, is open to position. Address "X. 24," Engineering News, New York. 24-6t

GRADUATE CIVIL ENGINEER, '10, with six months' experience in general surveying, wants a permanent position; go anywhere. Address BOX 6, North Bend, Clinton Co., Pennsylvania. 24-6t

GRADUATE CIVIL ENGINEER, with over 5 years' field and office experience on water-works, sewers, highways and canal (including reinforced-concrete designing and service as assistant engineer on Catskill Aqueduct) will, after Dec. 21, accept any kind of position, anywhere, with engineer or contractor; hustler, with best of references. Address "S. 24," Engineering News, New York. 24-3t

CIVIL AND HYDRAULIC engineer (38), sober, thirteen years' experience, wants traveling position to sell turbines; survey and plan water-power developments; moderate salary. Address "K. 25," Engineering News, New York. 25-10t

CONSTRUCTION ENGINEER, with broad experience on river and harbor work, railroad and trolley lines, plain and reinforced concrete, desires position with contractor or railroad; best references; location immaterial. Address "L. 25," Engineering News, New York. 25-4t

ASSOCIATE EDITOR of a leading engineering journal desires change; civil engineering graduate; four years in practice and nearly two years on editorial staff; specialised in municipal work. Address "S. A. 25," Engineering News, New York. 25-2t

CIVIL ENGINEER, graduate, now employed, 2 years with hydraulic engineer, desires position where this experience will be useful. Address "G. A. 25," Engineering News, New York. 25-2t

ENGINEER (technical) on railroad construction in far South, desires position about Feb. 1; eleven years' experience on construction, maintenance, and steel erection; first-class designer of bridges, drawspans, railway structures, substructure and superstructure; executive ability, system, used to handling men. Address "D. 26," Engineering News, New York. 26-4t

GRADUATE C. E., nine years' experience on railway location, construction and M. of W. and irrigation, desires position as chief of party, resident engineer, transitman, camp draftsman, levelman or topographer. Speaks Spanish, will furnish instruments for permanent position. Engineer, 2316 Taylor St., Chicago. 26-5t

GRADUATE ENGINEER (30), experienced designing plain and reinforced concrete dams, retaining walls, culverts, heavy steel, making hydraulic computations, estimates, etc.; wants connection with consulting engineer or contractor. Address "D. 17," Engineering News, New York. 26-2t

GRADUATE CIVIL ENGINEER, 35; 6 years' experience, general surveying, street, sewer construction, executive ability, location no object. Address "R. 26," Engineering News, New York. 26-1t

GRADUATE CIVIL ENGINEER, two years' experience on railroad and sewer construction work; good draftsman. Address "P. A. 26," Engineering News, New York. 26-1t

ASSISTANT ENGINEER; 9 years' experience; location, construction, maintenance; U. S.; Panama; Colombia; Bolivia; open for engagement. Address "S. A. 26," Engineering News, New York. 26-2t

Contractor's Engineer

CIVIL ENGINEER, PROFICIENT IN STRUCTURAL STEEL, REINFORCED CONCRETE, FIREPROOFING, FOUNDATIONS; COMPETENT ESTIMATOR, GOOD EXECUTIVE; WANT RESPONSIBLE POSITION, WITH GENERAL CONTRACTOR PREFERRED. ADDRESS "A. A. 16," ENGINEERING NEWS, NEW YORK.

Free to engage anywhere for

Irrigation or Water Power

Engineering. Have broad home and foreign experience and can show competency to take entire charge of examinations and planning of projects, construction and equipment of plants. CAN EARN FIVE THOUSAND A YEAR. Address "B. A. 26," Engineering News, New York. 26-1t

Bridge and Structural Engineers.

CHIEF ENGINEER, structural plant near New York, desires important position with progressive firm; age 33; graduate, experience all classes buildings, bridges, plate work; a hustler, good executive, and can get business. Address "P. B. 17," Engineering News, New York. 17-tf

A1 ESTIMATOR, 14 years' experience, structural steel, ornamental iron, general building construction; engineer graduate; at present with prominent house about to quit operations along certain lines, wants change. Address "F. A. 23," Engineering News, New York. 25-2t

GRADUATE ENGINEER, 10 years' detailing, 6 designing, checking, structural steel, reinforced concrete; buildings, bridges. Address CIVIL ENGINEER, 65 Chestnut St., Rutherford, N. J. 26-2t

CONTRACTING ENGINEER — Structural steel, 35 years; employed as engineer for steel concern, in charge of estimating and drafting room, contracting and erection; good all-round man, 17 years' experience; position in New York preferred. Address "B. 25," Engineering News, New York. 26-1t

Builder's Assistant

Structural designer, technical graduate, competent estimator, desires permanent position where executive ability and thorough knowledge and experience in all branches of building construction in office and field is requisite. Opportunity where results will merit rapid promotion and ultimately secure an interest in the business more important than amount of initial salary. Address "X. A. 26," Engineering News, New York. 26-tf

Surveyors.

INSTRUMENTMAN, five years on railroad, sewer, water and drainage work, desires position; now employed. Address "O. A. 24," Engineering News, New York. 24-3t

YOUNG INSTRUMENTMAN, twenty months' experience in city and country surveying, desires permanent position. Address "E. 25," Engineering News, New York. 25-3t

RODMAN OR CHAINMAN wishes position; 2 years, surveying and road work, any location. Address "S. 26," Engineering News, New York. 26-1t

TRANSITMAN—3 years' experience on farm surveys, rivers, construction of concrete dam and sewer pipe draftsman. Salary no object if chance for advancement. Best of references. John J. Dixon, Jr., 673 Monroe St., Brooklyn, N. Y. 26-2t

Draftsmen.

DRAFTSMAN; two years' experience mechanical railroad drafting, desires position; $12 per week to start. Address "E. A. 16," Engineering News, New York. 16-12t

TOPOGRAPHICAL and Map Draftsman desires position; first-class letterer; best of references. Address "P. A. 17," Engineering News, New York. 17-12t

NEAT DRAFTSMAN, B. S. degree, computations; stenographer and typewriter; last 3 years with city surveyor. Address "W. C. 17," Engineering News, New York. 19-12t

MECHANICAL DRAFTSMAN, 4½ years' pumping and mining machinery experience, desires position. Address "Z. 24," Engineering News, New York. 24-4t

STRUCTURAL AND MECHANICAL draftsman desires position. Address "C. 24," Engineering News, New York. 24-3t

EXPERIENCED, detailing, check[ing], designing, steel, concrete, timber, [over] ten years' experience; salary, [$] per month. Address "O. 25," [Engineering] News, New York. 25-2t

DRAFTSMAN, technical graduate, [years'] experience on power stations and [indus]trial plant design. General con[struction], mechanical and equipment work; [highest] references; present location, N[ew York] City. Address "R. 25," [Engineering] News, New York. 25-3t

DRAFTSMAN and civil engineer's [assistant], graduate, four years' experience [building] construction, municipal and hydr[aulic en]gineering, field and office, now e[mployed], desires better opportunity. Add[ress "H.] A. 25," Engineering News, New [York]. 25-2t

FIRST CLASS structural checker [desires] position; ten years' experience [with re]liable firms. Address "A. 26," E[ngineer]ing News, New York. 26-4t

YOUNG C. E., graduated in Europ[e wants] start as draftsman, preferably [rein]forced concrete work. Address [26,] Engineering News, New York. 26-1t

STRUCTURAL DRAFTSMAN wants [position] in Chicago district; experienced [in mill] buildings, heavy timber construct[ion, in]stalling machinery, etc. Address [Y. 26,] Engineering News, 1636 Monadn[ock Blk.] Chicago. 26-3t

STRUCTURAL DRAFTSMAN and [checker] wishes position vacinity New York [City]. 12 years' experience. Address "[G. 26,] Engineering News, New York. 26-2t

DRAFTSMAN—Graduate civil engineer, 3 years' experience in structural drafting and designing, wishes position. Address "M. 26," Engineering News, New York. 26-1t

Superintendents, Misc., etc.

WANTED—Position Supt. of Water Co. Had eleven years' experience construction, repairs and maintenance water-works; thirty-four years old, and married; references. Address "X. 15," Engineering News, New York. 15-12t

SUPERINTENDENT or Executive Engineer, Mem. Am. Soc. C. E., age 41; seventeen years' charge large contracts; extensive experience bidding and executive large contracts, water-works, sewers, filtration plants, dam, power plants, dredging, cofferdams, heavy excavation, massive and reinforced concrete; capable any work and any location; several years past in East; A1 references. Address "[I. 15,]" Engineering News, New York. 15-tf

PRACTICAL CONCRETE MAN open for proposition, railroad work, tunnel, river work, arches, municipal work. Address "B. 16," Engineering News, New York. 16-12t

ESTIMATOR—SALESMAN desires change; has held responsible positions in structural and mechanical lines. Address "D. B. 17," Engineering News, New York. 17-12t

MASTER MECHANIC and locomotive engineer, speaks Spanish and English; has 30 years' experience in United States, Central and South America, desires position. Address "F. F. C.," 472 Jefferson Ave., Columbus, Ohio. 23-6t

GENERAL SUPERINTENDENT, graduate civil engineer, desires change; ten years' experience on canal work, locks, dams, sea walls, dry docks and dredging; best references. Address "K. A. 23," Engineering News, New York. 23-4t

SUPERINTENDENT, thirteen years' experience, charge large public works; present employed. Open Feb. 1st. Best reference. Address "G. A. 23," Engineering News, New York. 23-4t

SUPERINTENDENT and Engineer, several years' experience on R. R. construction with contractors and R. R. companies, on heavy steam shovel work. Address "K. A. 24," Engineering News, New York. 24-3t

GENERAL SUPERINTENDENT, mechanical engineer, 13 years' general dredging experience, will be open for engagement February 1st. Address "A. A. 25, Engineering News, New York. 25-2t

REINFORCED concrete engineer, 28 years old; at present in charge of designing office of 15 men doing concrete building work, is open for offers; would consider position as salesman for reinforcing concern or engineer for contractor. Can handle either very satisfactorily. Best reasons for changing. Address "X. 26," Engineering News, New York. 26-3t

NOTICE —The "WANT" Columns of Engineering News are for the special benefit of bona-fide employers or employees, or for those wanting partners, sales agents, etc. Advertisements from employment agencies, schools and like institutions must be inserted under Bureaus and Agencies, at the rate of $1.50 an inch, displayed, or five cents per word.

Circulars addressed to our keyed advertisers will not be forwarded, as our "Want" advertisers have objected to receiving such matter, and we cannot give the time to forwarding them.

Persons answering want advertisements should not send original documents, but copies thereof.

Our readers and advertisers are asked to help us make these columns of the greatest use to those using them.

TECHNICAL GRADUATE of an engineering college (30) would like position with engineering firm in or near New York. Address "F. 21," Engineering News, New York. 25-3t

ESTIMATOR and Salesman, experienced in structural steel, ornamental iron and bronze; $2,400 minimum. Available about Feb. 1. Address "F. 26," Engineering News, New York. 26-2t

PRACTICAL MECHANICAL MAN desires responsible position with progressive concern in Pacific Coast States; 23 years experience in various mechanical lines, 10 years in executive positions; thoroughly trustworthy, sober, ambitious; capable of producing satisfactory results in the higher positions of trust and responsibility. American, married, now employed. Address "C. 26," Engineering News, New York. 26-2t

OFFICE MAN experienced in machinery line; all office details; bookkeeper, stenographer, correspondent; executive ability. W. 329 Alexander Ave., New York. 26-1t

PAPER MILL ENGINEER—Experienced superintendent of building and maintenance open for engagement; fifteen years in present position. Details will be given. Address "K. 26," Engineering News, New York. 26-4t

FOREMAN, ten years' experience heavy construction, reinforced, massive concrete work. Address "C. A. 26," Engineering News, New York. 26-1t

GRADUATE ENGINEER (30); position with general contractor; 8 years' experience. Address "W. 26," Engineering News, New York. 26-1t

SALESMAN—Graduate civil engineer, 29 years old, wishes position as salesman or representative. Address "O. A. 26," Engineering News, New York. 26-1t

MECHANICAL ENGINEER, with general engineering experience, and two years' experience in selling machinery, would like to enter the sales department of manufacturer of engineering articles or dealer in machinery. Address "K. 19," Engineering News, New York. 26-2t

TIMEKEEPER, familiar with up-to-date methods; several years' experience on public works; references. Address "D. A. 26," Engineering News, New York. 26-1t

FOR ADDITIONAL
"SITUATION WANTED"
ADVERTISEMENTS
See Construction News page 316.

Situations Open
(OR VACANT)

Rates 3 cents a word a time, set solid; 4 cents single leaded; 4½ cents double leaded; display $1.50 an inch. Miscellaneous wants are the same rate.

WANTED—First-class checkers and detailers on structural work; none but experienced men need apply. Address "A. 20," Engineering News, New York. 20-tf

SALES AGENTS WANTED to sell steam Turbine Blowers, Feed Water Regulators, Ventilating Fans, Pumps, etc.; guaranteed territory; commission. WING, 90 West St., New York City.

WANTED—Quarry superintendent for stone crushing plant in New York State, married man from twenty-five to thirty years old, with technical education preferred. Address "P. 25," Engineering News, New York. 25-4t

WANTED—First class structural iron detailer and checker. Must be able to take full charge of Engineering Department in small shop in Chicago. Address "N. 26," Engineering News, 1636 Monadnock Block, Chicago. 26-1t

SALESMAN—For metal window sash; one experienced with solid steel sash preferred; good opportunity for man willing to travel and who understands plans. Address P. M. LOUWERSE, c/o Trussed Concrete Steel Company, Detroit, Mich. 26-tf

EXPERIENCED instrument men wanted for permanent position on hydro-electric development work. State full particulars regarding education, experience, and references. Address "B. 26," Engineering News, New York. 26-2t

WANTED—A foreman to take charge of earthen dam construction. State experience with steam shovel and cars and track. Address "E. 26," Engineering News, New York. 26-4t

WANTED—Experienced dirt mover to take charge of large proposition, must understand handling steam shovels, hoisting engines, track building, etc. Permanent position. Address "W. A. 26," Engineering News, New York. 26-1t

REINFORCED CONCRETE ENGINEER wanted to design and sell bar reinforcement; experience in both branches essential. State salary wanted. 117 Home Life Building, Toronto, Ont. 26-1t

FIRST-CLASS OFFICE MAN for building contractors campany operating in Newark and vicinity. Must be good draftsman, estimator, and thoroughly familiar with all detail work in connection with construction of factory buildings. None other than those familiar with mill and reinforced-concrete construction need apply. Address "R. A. 26," Engineering News, New York. 26-1t

WANTED—Neat, careful and accurate draftsmen, familiar with bridge construction and bridge shop drawings. Long job. Address "Z. A. 26," Engineering News, New York. 26-3t

WANTED—Experienced draftsmen on structural and mechanical work; state salary and experience. Address "A. A. 26," Engineering News, New York. 26-1t

Engineer Wanted

To succeed retiring member in well established and prosperous engineering company. Investment necessary, but not large. Executive, business getting and general engineering ability essential. Address "N. 23," Engineering News, 1636 Monadnock Block, Chicago.

Wanted by large Manufacturing Company, an experienced salesman familiar with hydraulic and steam machinery. Territory South American countries. Must speak Spanish. Apply in writing, stating experience. Address Hydrosteam, Post Office Box No. 824, New York.

FOR ADDITIONAL
"SITUATION OPEN"
ADVERTISEMENTS
See Construction News page 316.

Miscellaneous Wants

Cards under this head are inserted in uniform style, in solid type, at 3 cents a word (address to be counted); displayed (to occupy not less than one inch space), $1.50 an inch. Cash MUST accompany the order in all cases.

DRAWINGS, all kinds prepared, competent engineers, detailing and designing. HARRY W. MOOL CO., 352 Brandeis Theatre Bldg., Omaha, Neb. 24-tf

ENGINEERING WORK, drawings made, patents developed; reasonable prices. Address "Z. 25," Engineering News, New York. 25-2t

EXPERIENCED municipal and railroad engineer desires position as representative or manager for contracting firm, or kindred business; capable estimator and mechanical experience. Address "B. 24," Engineering News, New York. 26-1t

BUILDER (C. E.), offered large amount of work without competition requires additional capital to finance. Payments and legitimate profits guaranteed. Address "P. 26," Engineering News, New York. 26-1t

WANTED—Partner with capital for large municipal contract in West Indies; large profits. Address "L. 26," Engineering News, New York. 26-1t

INVENTING to order.—Mechanical engineer designs original machinery and appliances; terms reasonable. Address "BENJAMINS," 166 Vernon Ave., Brooklyn, N. Y. 26-1t

WANTED
ASPHALT PLANT

complete, one-car Asphalt Plant. Advise location of plant and time it has been used; also lowest cash price. ADVANCE CONSTRUCTION CO., Waukesha, Wis. 24-tf

COMPETENT
ITALIAN LABORERS
Supplied Free of Charge

For railroad building, water-works, quarries, and all kinds of construction work by
THE LABOR INFORMATION OFFICE FOR ITALIANS.
(Incorporated.)
59 LAFAYETTE (formerly Elm) STREET
NEW YORK CITY.

No charge either to applicants for help or to the laborers.
Send for circulars and application blanks.

Partner Wanted

Two young engineers, Members Amer. Soc. C. E., 31 and 28 respectively, both having thorough knowledge of building contracting business, are offered through their connections, an amount of work sufficient to keep them busy for five years, without competition, provided they can finance same. Are seeking partner of their own type, who has business experience and executive ability sufficient to manage office and finances, who can provide $25,000.00 capital in installments as required during the first year. The work is out of town, but headquarters in New York City. Address "O. 26," Engineering News, New York. 26-1t

Hayden Machinery and Supply Co.
CONTRACTORS' TOOLS AND SUPPLIES
30 Church Street New York
Telephone, 1016 Cortlandt

FOR ADDITIONAL
"MISCELLANEOUS WANTS"
ADVERTISEMENTS
See Construction News page 316.

AGENCIES OR BUREAUS
FIVE CENTS A WORD

NEW WORK
OF ALL KINDS

is followed closely, and changes in existing organizations are constantly watched carefully, in order that we may obtain you a better position. Send for application blank.

The Engineering Agency, Inc.
ESTABLISHED 1893
Monadnock Block, Chicago, Ill.

THE BEST WAY

to get a Good position in Drafting or Engineering is to file an application direct with some of our clients who are depending on us to get competent and experienced applicants for their Vacant Positions. Send stamp for blank and List of Vacant Positions.
CLEVELAND ENGINEERING AGENCY,
Rose Bldg., Cleveland, Ohio.

WANTED—Axemen, $600 to $720; chainmen, $720 to $900; rodmen, $900 to $1,200; highways inspector, $1,200 to $1,500. The New York State Civil Service Commission announced the above examinations to take place January 28th, 1911. Applications filed before January 21st.
We prepare you thoroughly for all civil service engineering positions; act quickly.
MENDELL SCHOOL,
24-4t 117 Second Ave., New York.

ENGINEERS FURNISHED
Without expense to the employer. We furnish engineering men in all branches of electrical, mechanical, hydro-electric, irrigation, sanitary, railroad, construction and mining work, from a $50 to a $500 a month man. Engineering department under the direct supervision of a consulting engineer.
THE INTERSTATE COMPANY.
(Established 1905.)
Kittredge Bldg., Denver. 25-4t

The rate for display SITUATION WANTED ADVERTISEMENTS is $1.50 per inch

Engineering Employees Secured

For seven years we have furnished the prominent irrigation, railroad, hydro-electric, power and general engineering and construction companies with engineering men in all capacities, from chainmen up to chief engineer. We are in touch with a large number of thoroughly competent experienced men whom we can secure for employers on short notice. In writing, give information regarding project, duties, salary, etc. BUSINESS MEN'S CLEARING HOUSE CO., Dept. N., Century Bldg., Denver, Colo., U. S. A.

Salaried Positions
Now Open

FOREMAN: Bottling mineral water, $780. DRAFTSMAN, architectural, knowledge of ornamental, $728. AD-465. DRAFTSMAN, structural steel, $1800-$2400. AD-844. DESIGNER, sugar machinery, $1200-$1800. AD-813. Hundreds of other opportunities for Executive, Sales and Clerical Men. Our booklet "Salaried Positions" explains all. Correspondence confidential. Call personally or write.

Business Service Co.
(Agency)
805 Singer Building New York
or any of our other offices in Philadelphia, Pittsburgh, St. Louis, Minneapolis, Chicago. Foreign Correspondents.

Please Mention ENGINEERING NEWS

Engineering News

is more frequently consulted for
TECHNICAL HELP
MISCELLANEOUS WANTS
SALE OF SECOND-HAND MACHINERY AND EQUIPMENT
than any other Engineering Journal in the United States.

BINDING

SUBSCRIBERS and Advertisers desiring to have their copies of Engineering News bound in complete volumes should send them by express PREPAID to

R. A. CZERMAK
69 Fulton Street
New York City

and not to this office. Volumes should be arranged in order of dates and checked carefully before sending. When bound they will be returned COLLECT by the binder with bill for services. Single volumes $2.00 each. Five volumes or more, bound singly, $1.75 each.

The Engineering News Publishing Co.

FOR SALE

Stone Crushing Plant

Capacity, 400 tons 10 hours. Jaw Crushers —large 24" x 15" tailing 16" x 10"; Elevator, Screens, Boiler, Engine, Storage-bins (for loading cars and wagons). All modern, heavy and good as new. Drawings furnished for taking down and re-erecting. Address "S. 25," Engineering News, New York. 25-8t

FOR SALE.
Two new No. E-24 Sargent Type

Steam Drills

Complete with tripods, weights, etc. Two rebuilt No. D-24 Sargent Steam Drills, complete with tripods, weights, etc. Four Hose Connections, with Couplings.

The above are complete in every particular and in perfect condition. The rebuilt drills being practically new. The entire outfit used only four (4) months.

We should be pleased to receive an offer or communications on the subject. Address "W. 25," Engineering News, New York. 25-3t

LEATHER BELTING

We are selling a special lot of single and double belting

MUCH BELOW STANDARD PRICES.

Some is slightly stock-worn, but all is absolutely new and of best quality. Send your inquiries while the range of sizes is complete.

L. F. SEYFERT'S SONS, Incorporated.
437-39 No. Third St., Philadelphia.

FOR SALE.
One No. 3 Buffalo

Concrete Mixer

capacity 75 to 100 cu. yds. per day. Practically as good as new. Guaranteed first-class condition.

TRINIDAD ASPHALT MFG. CO.,
26-1t St. Louis, Mo.

FOR SALE.
One Kelly three wheel

Road Roller

12 to 15 tons. First-class condition.

TRINIDAD ASPHALT MFG. CO.,
26-1t St. Louis, Mo.

TRANSITS AND LEVELS

FOR SALE
Immediate Delivery

Gurley Engineer's Transit, Level bubble, arc and stadia, complete with box and tripod $135
K. & E. Engineer's Transit, level bubble arc and stadia, complete with box and tripod $145
Gurley 20" Wye Level, complete..... $75
Gurley 22" Wye Level, complete..... $75

Send for complete list of instruments.

THE ENGINEERING AGENCY, INC.,
Supply Dept.,
Monadnock Block, Est. 1893. Chicago, Ill.
26-1t

FOR SALE

One second hand 10 x 7 x 15

Duplex Piston Pump

in first class condition;

Price, $250.00

F. O. B. Pittsburgh, Pa.

Ohio Valley Water Co.

25-2t **Bellevue, Pa.**

STEEL PILING

Second-hand Steel Piling. First-class condition. Various lengths.

G. D. SMITH, 414 Fisher Bldg., Chicago

Send for List Contractors' Equipment.
24-3t

SPECIFICATIONS FOR

RAILWAY STATIONS

By CLARK DILLENBECK

Stone and Brick Passenger Stations
Frame Passenger Stations
Stone and Brick Freight Houses
Frame Freight Houses

Each occupying about 82 pages. 8x14 ins. Price, 40 cents each; Full set $1.50

The Engineering News Book Dept.

FOR SALE

Space under this head is sold at the uniform rate of $1.50 an inch; minimum charge, $1.50 a week.

FOR SALE.

Relaying Steel Rails With Splices

190 tons, 35 lbs. per yard.
150 tons, 40 lbs. per yard.
200 tons, 48 lbs. per yard.
2,500 tons, 60 lbs. per yard.
900 tons, 65 lbs. per yard.
1,500 tons, 67 lbs. per yard.

NEW STEEL RAILS WITH FASTENINGS,
All Weights.

THE STEEL RAIL SUPPLY COMPANY,
2 Rector St., N. Y. City.

FOR SALE

Atlantic, 70-ton, near new, $5,250.
Marion, Style A. Best offer takes it.
20 x 20 x 24 McKiernan Compressor, with Air Tank, equal to new, $1,300.
Boilers, Crushers, Mixers, Pumps, etc.
THE NEW YORK PURCHASING AGENCY, INC.,
76 Pine St., New York City.
AGENTS FOR "COLTRIN" CONCRETE MIXERS

FOR SALE

NEW STEEL RAILS

We have a quantity of new steel rails up to 40 lbs. per yard in weight, which we can offer at attractive figures, for shipment out of stock New York.

Also Frogs and Switches.

Write for prices.

WONHAM, SANGER & BATES
30 Church Street, New York, N. Y.

FOR SALE.

Hydraulic Dredge

20-inch Hydraulic Dredge.
F. S. LEWIS,
Bullitt Bldg., Phila.

FOR SALE.

Road Roller

1—12-Ton Harrisburg Road Roller, guaranteed in first class working condition, complete with all fittings. Low price for quick disposal.

JOHN F. CONNELL,
120 Liberty St., New York City.

FOR SALE.
One No. 1 Browning Crane

38' boom, ¾-yd. Clam-shell Bucket, canopy top, standard gauge trucks, double drums, outriggers and rail clamps, and all fittings; has been used only a few weeks. To a prompt cash buyer we will name a very close price. Ready for prompt delivery, f. o. b. cars, Norfolk, Va.

HOBBS-NEWBY EQUIPMENT CO.,
Norfolk, Va. 25-2t

FOR SALE

FOR RENT—Little Giant traction shovel, new 1909.
Two 45-ton and one 70-ton shovel.
Relaying rails, 35-40-50-60 pound.
Locomotives, dump cars, both gauges.
NEW "EASTERN" Dump Cars, 36" gauge.

CHAS. F. AVERY
45 Broadway, N. Y.

HOISTS! HOISTS!

10 x 10—3 Drum Clam-shell or Scraper Hoist.
40-HP. D. D. Engine; lift 9 tons single line.
6½ x 12—4 Spool Erectors Engine with Boiler.
8½ x 10 D. C. D. D. B. | 8 x 10 D. C. D. D.
11 x 10 D. C. D. D. B. | 7½ x 10 D. C. D. D.
6½ x 10 D. C. D. D. B. | 7 x 10 D. C. D. D.
6¼ x 8 D. C. D. D. B. | 5½ x 8 Swinger.

Carlin Machinery and Supply Co., Inc.
225 Sandusky, St., N. S., Pittsburgh, Pa.

Contractor's Plant

FOR SALE.

Locomotive Cranes, Derricks, Concrete Mixers, Electric Hoists and Car Hauls, Cableways, Locomotives, Steam Shovels, Hoisting Engines.

All necessary equipment for complete plant.

JOHN M. GREENE,
Drexel Building, Philadelphia, Pa.

ELLIS PATENT BUMPING POST
SIMPLE, STRONG AND LASTING
ADAPTED TO ALL POSITIONS

STANDARD FREIGHT POST
MECHANICAL MFG. COMPANY, Chicago, Ill.

Locomotives

Consolidation, Mogul, Ten Wheel and Switch type; 140 narrow and Standard Gage.

Largest Stock of Locomotives in United States

Southern Iron and Equipment Co.

ATLANTA, GEORGIA

FOR SALE

PIPE

Second-Hand

All sizes, ⅛ inch to 18 inches.
furnished with new threads and couplings, suitable for all practical purposes; large stock constantly on hand, together with a general assortment of used contractors' machinery.

Marine Metal & Supply Co.
167 South Street, New York

FOR SALE OR RENT

One Baldwin 10 x 12 Standard Gauge Locomotive.
One Dickson 9 x 14—36" Gauge Locomotive.
Twelve 36" Gauge 3½ yd. Allison Dump Cars.
Ten 1½ yd. Western 2-way 36" Gauge Dump Cars.
One No. 2 Chicago Concrete Mixer with steam engine and boiler mounted on trucks.

HARPER MACHINERY COMPANY
50 Church St., NEW YORK CITY.
Yards and Shops: Roselle, N. J.

FOR SALE.

Electric Hoists and Derricks

2—Lidgerwood Electric Hoists, size No. 519 and 510 P, Double Friction Drums, 16" diameter, 24" between Flanges; complete with General Electric 40-HP. motor arranged for 220 Volts. These Hoists have been thoroughly overhauled and are in as good condition as new.
2—Stiff Leg Derricks, complete, masts 16" x 16" x 34' long. Booms, 15" x 16" at butt tapered to 14" x 14" at ends, 64' long.
1—Guy Derrick, mast 14" x 16" at Butt, tapered to 14" x 15" at top, 63' long. Boom 12" x 12" x 57' 6" long.

All the above ready for immediate shipment. JOHN F. CONNELL,
120 Liberty St., New York City.

FOR SALE PROMPT SHIPMENT LOW PRICES

100 tons first-class 56 lb. steel "T" Relaying Rails, with angles.
1-175 H. P. 72" x 20' Horizontal Return Tubular Boiler. Has been insured by Hartford Company for 125 lbs. Fixtures complete. First-class outfit.

DALLETT & COMPANY
611-12 Harrison Bldg. Philadelphia

FOR SALE.

One 22 x 42 Corliss Engine, $1,250. One 13 x 15 McIntosh & Seymour Automatic. One 12 x 12 Armington & Sims Automatic. Two 5 x 6 Ideal Automatic. One 10 x 10 Ames Automatic. Several first class Steam Pumps of various sizes, Hoisting Engines, Derricks, Cableways, Boilers. A general line of Contractor's Material for prompt delivery.

O. R. WHITNEY,
39 Cortlandt St., New York City.
Telephone Cortlandt 6095.

Modern 73-ton Baldwin Consolidation Locomotive

¶ Just thoroughly overhauled. Built 1899. Carries [illegible] pounds working pressure.

¶ If you are in the market for railway equipment of any description, tell us your needs.

E. H. WILSON & COMPANY
ARCADE BUILDING
PHILADELPHIA

Boiler Bargains

2 72x18 B. S. Boilers, 125 pounds.
2 78x20 L. J. Boilers, 115 pounds.
5 72x20 L. J. Boilers, 100 pounds.
2 72x18 L. J. Boilers, 90 pounds.
2 66x18 L. J. Boilers, 90 pounds.
2 60x16 L. J. Boilers, 90 pounds.

Send for our new 1000-page Catalog No. 258. It will cost you nothing.

CHICAGO HOUSE WRECKING CO.
35th and Iron Streets, CHICAGO, ILL.

FOR SALE OR RENT

8—10 x 16, Porter, 36" S. T. Locomotives.
2—10 x 16 Baldwin, 36" S. T. Locomotives.
1—13½ x 22, Baldwin, S. G., S. T., 6 driver Locomotive.
15—50,000-lb. capacity S. G. flat cars.
1—26-Ton, Little Giant special traction shovel.
1—26-Ton, Little Giant standard traction shovel.
1—40-Ton, Marion, "A" S. G. Steam Shovel.
7—Steel Plate Girders, 48" x 61'.
100—Steel Plate Girders, 36" x 39'.
7—Lambert Electric Hoists, 30, 40 and 60 HP., D. C., 220 Volt, with boom swing.
50—Hoisting Engines, Lambert, Mundy and Lidgerwood, skeleton or mounted, with or without boom swing, 1, 2 and 3 drums, 10 to 50 HP.

HENRY A. HITNER'S SONS CO.
Philadelphia, Pa.

FOR SALE.

1—¼ Yard Cube Mixer, on trucks with Gasoline Engine.
1—No. 3 Foote Continuous Mixer on trucks with steam power.
1—No. 3 Foote Continuous Mixer on trucks with Gasoline Engine.
2—No. 4 Champion Crushers, Elevators, Screens and Engines.
2—6¼ x 8 D. C. D. D. Skeleton Hoisters.
1—7 x 10 S. C. S. D. Lidgerwood Hoisters.
2—No. 4 Pulsometer Pumps.
1—6½ Deane Pump.

McKelvey Machinery Co., Inc.
6 Albany Street, New York, N. Y.

CONCRETE MIXERS

1—No. 10 "Smith," complete with engine, boiler, side loader.
3—No. 3 "Ransome" with engine.
1—No. 4 "Ransome" with engine, on wheels.
2—11 cu. ft. "Municipal" with engines.

All can be seen at our warehouse, Philadelphia, ready for immediate delivery.

L. F. SEYFERT'S SONS, INC.,
437-441 N. Third Street, Philadelphia.

BOILERS

2—60 HP. Economic type; 1—80 HP. Firebox type; 1—75 HP. Firebox type; 1—50 HP. Firebox type; 1—60 HP. Vertical tubular; 1—40 HP. Vertical tubular; 1—30 HP. Vertical tubular; 1—20 HP. Vertical tubular; 1—35 HP. Submerged tube; 1—30 HP. Submerged tube.

We will guarantee any of the above boilers for 100 lbs. steam working pressure.

Contractors Machinery & Supply Co., Pittsburg, Pa.

FOR SALE.

THREE FIRST CLASS DERRICKS

One Guy Derrick, 60' Mast, 54' Boom.
One Guy Derrick, 58' 6" Mast, 63' 6" Boom.
One Stiff-leg Derrick, 35' Mast, 48' 6" Boom.

With sills, diagonals, braces, shoes, etc. All of 10" x 10", 10" x 12" and 12" x 12" long-leaf yellow pine. All these derricks are fitted with latest type of "American" fittings, including guy cap, boom points, sheaves, mast brackets, mast tops, mast bottom with double step and sheaves, fall line weights, straps, splices, guy and hoisting cable, turnbuckles, etc. All practically new. Have been used four months; perfect condition. Well painted and protected. Full information can be obtained by applying to "X. 25," Engineering News, New York. 25-3t

CLEANLINESS is a Great Feature of METALINE BEARINGS

Write to us and we will tell you all about others

NORTH AMERICAN METALINE COMPANY
6 West Avenue, Long Island City, N. Y.

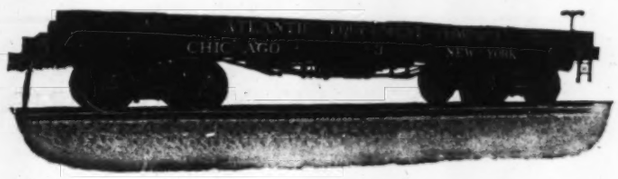
FOR SALE OR RENT

Hoisting Engines.
Guy and Stiff-Leg Derricks.
Complete Driving Outfits.
Direct-Connected Centrifugal Pumps.
Complete Stone-Crushing Plants.
Air-Compressors and Pile Drivers.

MARVIN BRIGGS, Inc.
167 Sixth St., Brooklyn, N. Y.

IMMEDIATE SHIPMENT

THOROUGHLY OVERHAULED



54-Ton Ten Wheel Locomotives
50-Ton Rebuilt Switching Locomotives
51-Ton Mogul Locomotives
30-Ton Flat Cars
Passenger Coaches
Combination Cars

ATLANTIC EQUIPMENT COMPANY

RAILWAY EXCHANGE, CHICAGO — 30 CHURCH STREET, NEW YORK

2101 BEAVER AVENUE, PITTSBURG, PA.

PLEASE FAVOR US WHEN WRITING ADVERTISERS BY MENTIONING ENGINEERING NEWS

FOR SALE=MANUFACTURING PLANT

PARTIALLY EQUIPPED

Formerly occupied by Fox Pressed Steel Equipment Co., and located opposite Illinois Steel Company's Works, Joliet, Illinois.

LAND—Net Acreage 19.01

BUILDINGS

Main Building, 400 x 80.
Boiler, Engine and Accumulator Building, 160 x 40.
Machine Shop, 160 x 30.
Storehouse Building.
Template Storage Building.
Office Building.

GOOD RAILROAD FACILITIES

EQUIPMENT

Three 300 H.P. Lancashire Boilers with Cochrane Heater, Feed Pump, Piping and Valves, Stack, Settings, etc.
Reynolds-Corliss Engine with Line Shaft, Brackets, etc.
Two 5-Ton 40' Span, Overhead Cranes.
Buckeye Engine.
Oil Storage Tank.

For terms and further particulars, address or call, N. S. REEDER, 1470 Old Colony Bldg., Chicago, Ill.

2 THEW Type "O" Steam Shovels, Traction or Trucks, but little used; practically new; prompt delivery.
2 BUCYRUS 70-ton Shovels. Good order. High shop numbers.
2 MARION Model 20's. Fine condition. Little used.
1 First-class 10-ton Locomotive Crane; immediate delivery; low price.
Agents—TOLEDO Wheelbarrows. Every Style. Highest Grade.

DALLETT & COMPANY, 611-12 Harrison Bldg., Philadelphia, Pa.

FOR SALE FOR IMMEDIATE DELIVERY

We have the following rebuilt machinery in our yards at Milwaukee, Wis., and can be inspected at any time for immediate delivery.
1—Marion Model 50-60 ton steam shovel No. 1723.
1—No. 0 Thew shovel full circle ⅝ yd. dipper with both traction and track wheels.
1—60-ton Vulcan class D, fire-box boiler 1½-yd. dipper steam shovel.

TRENCH MACHINES

1—10-ft. Buckeye trench machine cuts a trench 28 inches wide by 10 ft. deep.
2—7½-ft. Buckeye trench machines by 28 inches wide.
1—7½-ft. Buckeye trench machine by 30 inches.
1—10-ft. Buckeye trench machine that cuts a trench 30 inches to 32 inches wide equipped with Apron wheels.

CONCRETE MIXERS

1—No. 1 Chicago concrete mixer with steam engine and boiler mounted on trucks with turbine loader.
1—No. 1 Smith concrete mixer mounted on trucks with steam engine and boiler.
1—No. 1 Chicago concrete mixer mounted on trucks with steam engine and boiler standard equipment.
1—No. 1 Koehring mixer mounted on trucks with steam engine and boiler and side loader.

Write us your wants. We manufacture the Cream City Concrete Mixer, new in all sizes.
CREAM CITY EQUIPMENT CO. 24-3t 814 Majestic Building, Milwaukee, Wis.

Second Edition, Revised and Enlarged, 1906

"Economics of Road Construction"

Cloth, 6 x 9 ins.
49 Pages; 9 Illustrations
Price, $1.00 net

By H. P. GILLETTE

TITLES OF CHAPTERS

Historical Review
Earth Roads and Earthwork
Gravel Roads
Macadam Roads
Telford Roads
Repairs and Maintenance
Suggested Improvements in Existing Road Specifications
Summary and Conclusions

The Engineering News Book Department
220 Broadway, New York

RELAYING RAILS. ALL WEIGHTS and SECTIONS

Handily located to various parts of the United States.

BLOCK POLLAK IRON CO.

General Offices
First National Bank Bldg., CHICAGO
ST. LOUIS CINCINNATI

M. E. DAVIS, Eastern Sales Agent

WESTERN WHEELED SCRAPER COMPANY

NEW YORK OFFICE, 50 CHURCH STREET. Phone, 6214 Cortlandt

Immediate shipment from nearby stock of **Wheeled and Drag Scrapers, Plows, Wagons, etc.**

STEAM SHOVELS AND OTHER PLANT TO LET

Address TROY PUBLIC WORKS COMPANY
R. W. SHERMAN, President UTICA, N. Y.

CONTRACTORS' EQUIPMENT

92 Ton Vulcan Shovels
55 Ton Marion Shovels
45 Ton Bucyrus Shovels

50 to 80,000 lbs. CONSTRUCTION FLAT CARS

12 to 65 ton CONTRACTORS' LOCOMOTIVES

6 Yard Western Dump Cars
12 Yard Western Dump Cars
12 Yard Oliver Dump Cars

New York Office
140 Cedar Street

FITZ-HUGH, LUTHER CO.
RAILWAY EQUIPMENT

Chicago Office
Monadnock Building

PLANT SALE

Mack Paving & Construction Co.

WHITE PLAINS, N. Y.

Have for sale the entire plant used in constructing Bronx Valley Sewer from Wakefield to North White Plains.

This plant was new in 1908, and is in good working condition now.

IT CONSISTS OF

15 300′ span cableways with Lidgerwood 7x10 engines and boilers, complete.
2 stiff leg derricks, complete, with 7x10 Lidgerwood hoisting engines and boilers.
24 Ames portable locomotive boilers on wheels, from 10 to 40 HP., with injectors, gages, etc., complete.
26 centrifugal, Morris Machine Works, pumps, 4″, 5″ and 6″ discharge, with suction hose, discharge pipe, primers, etc., complete.
4 Emerson pumps, complete, with foot valves, etc.
2 Snow horizontal boiler pumps.
20 Edson diaphragm pumps, with 3″ suction hose, complete.
2 Edson lift and force pumps.
7 Ingersoll-Rand steam pile hammers, 2 sizes.
9 McKiernan steam pile hammers, 2 sizes.
2 Arnott steam pile hammers.
19 Ingersoll-Rand 3¼″ steam and air drills.
1 Ingersoll-Rand air compressor, A-1, 14x14½, complete.
2 Climax portable crusher outfits, complete on wheels.
60 steel dump buckets, ½ and ¾ yard.
31 steel plates, 9′x10′ hand mixing concrete.
4 Ransome concrete mixers, Nos. 2 and 3, with steam engine on same frame, and with elevators.
And a large assortment lesser articles and tools.

MACK PAVING & CONSTRUCTION CO.

30 Orawaupum St. (near R.R. Sta.), WHITE PLAINS, N. Y.

'Phone, 1455 White Plains — Also, 2032 Land Title Bldg., Phila., Pa.

TO fill the ever-recurring vacancies in his staff of skilled employees is a question that vexes every manufacturer and employer of **Technical Help.**

ENGINEERING NEWS, the leading publication in the field of Civil, Electrical, Mechanical and Mining Engineering, offers a solution of this problem by means of its

SITUATION OPEN COLUMNS

RATES:

3 cents per word set solid
4 cents per word set single-leaded
4½ cents per word set double leaded
$1.50 per inch displayed

We should be pleased to give further information on this subject upon request to the "Classified Department."

THE ONLY WORK ON THE SUBJECT

MUNICIPAL FRANCHISES

By Delos F. Wilcox, Ph. D.

Chief of Bureau of Franchises of the Public Service Commission for the First Division of New York

Author of "The American City," "The Study of City Government," "The Government of Great American Cities," etc.

Write for circular giving full contents

Cloth; 5 x 7 inches; about 720 pages. Price, $5.00 net

The Engineering News Publishing Co.

220 Broadway, New York

YOUR PROPOSAL NOTICES IN ENGINEERING NEWS
Reach the Largest Circulation in the Civil Engineering and Contracting Field

Elementary Algebra

A MANUAL OF

EXAMINATIONS IN MATHEMATICS

Regents' Questions and Answers

Edited by L. H. LUBARSKY, B. S.

This work has been compiled with the desire to help teachers and students in the difficult task of preparation for the Regents' College Entrance, High School, Civil Service, and similar examinations.

The work is divided into two parts: Part I contains the question papers as set by the Board of Regents since 1901; Part II contains complete answers to these questions, thoroughly worked out by the best known methods.

These questions cover the whole field of elementary algebra, and a candidate for any examination in this subject can hardly meet with a question with which this manual will not make him familiar.

Cloth; 6 x 9 inches; 288 pages. Price, $1.00 net

The Engineering News Publishing Co.

220 BROADWAY, NEW YORK CITY

Before locating that

NEW FACTORY

or deciding on a new location for your

Present Works

afford us an opportunity to present to you the advantages of locating at

Ellwood City, Pa.

Four Steam Railroad Systems.
No Switching Charges.
Pittsburgh Freight Rates.
Excellent Water.
Cheap Electric Power.
Natural Gas.
Free Factory Sites, are a few of the many advantages.
For further information address

The Pittsburgh Co.
Ellwood City, Pa.

FOR SALE.
40, 50, 60, 80 and 100,000 capacity
Hopper Gondolas
in lots to suit. Have air brakes. Give us you wants.
THE MALES CO.,
26 Cortlandt St., 1508 First Nat'l Bank Bldg.
New York City. Cincinnati, Ohio.

RELAYING RAILS
Railway and Contractor's Equipment
BOUGHT AND SOLD
HYDE BROTHERS & COMPANY
Commonwealth Bldg. Pittsburgh, Pa. 50 Church Street New York, N. Y.

FOR SALE OR RENT
70 ton Bucyrus Steam Shovel
JAS. S. BRADEN
26 Cortlandt Street NEW YORK

Steel Piling
New and Second-hand, various lengths. Prices very low.
WALTER A. "ZELNICKER" SUPPLY CO.
In St. Louis
Our Bulletin, Rails, Equipment, Heavy Machinery Now Ready.

FOR SALE.
DUMP CARS
7 K. & J. Dump Cars, 4 yards, 36" gauge, in excellent condition. A great bargain. Located in New York. Immediate shipment. Address "D. 9," Engineering News, New York.

Now is the Time
to dispose of your
Second-Hand Machinery
Contractors' Supplies
AND
Equipment
TRY OUR
"FOR SALE"
PAGES
$1.50 per inch per insertion

FOR ADDITIONAL "FOR SALE" ADVERTISEMENTS
See Construction News page 316.

PLANT SALE

The Croton Falls Construction Company of Brewster, N. Y.

have for sale the following contractors' outfit. Contractors needing any article of Plant below enumerated would do well to look this offering over before purchasing elsewhere.

The entire Plant is almost new and as soon as released each article was passed through the shop and thoroughly overhauled and put in first class working order, making it practically as good as a similar article coming from the manufacturer's hands.

2 13'x5' Air Receivers, 8" Connections.
1 21½'x5' Air Receivers, 8" Con.
1 13¼'x5' Air Receivers, 4" and 5" Con.
1 7" 7'x3' Air Receiver, 2" and 4" Con.
1 40 H. P. Locomo. Boiler on skids
1 60 H. P. Locomo. Boiler on skids
1 70 H. P. Locomo. Boiler on skids
1 50 H. P. Vertical Boiler
1 35 H. P. Vertical Boiler
1 30 H. P. Vertical Boiler
1 25 H. P. Vertical Boiler
3 40 H. P. Loco. Boilers on wheels
6 200 H. P. Vertical Boilers, water tube
12 2½ yd. Excelsior Buckets, Stuebner
6 2 yd. Cyclopean Buckets
6 2½ yd. Cyclopean Buckets
4 ½-yd. Dump Buckets
1 1 yd. Excelsior Bucket
3 1 yd. Hains Buckets
1 Ingersoll-Sergeant Compressor, Class F
2 Ingersoll-Sergeant Compressors, Class H. 15x28x25¼
1 Vulcan Straight Line Compressor, 20x20x30
1 No. 10 McCully Crusher with Screens Complete
1 No. 6 McNulty Crusher, no Screens
2 Climax 9x15 Crushers with 9x12 Engines
3 Narrow Gauge Box Cars
1 Observation Pay Car
1 Closed Pay Car
2 Flat Cars, Light
30 Flat Cars, Heavy
30 4 yd. One Way Dump Cars
44 4 yd. Two Way Dump Cars
2 1½ yd. Two Way Dump Cars
45 Carts
15 Troy Dump Wagons
80 Pairs 33" Car Wheels with 4¼x8 Journals and Boxes Complete
2 70 ton Bucyrus Shovels
1 30" Belt Conveyor, 250' long, Complete
2 30" Belt Conveyors, 1 330' and 1 395' long, Complete
14 Stiff Leg Derricks, 40' Mast, 70' Boom, Complete
7 75' Guy Derricks, 70 to 75' Boom, Complete
19 Murphy Drills, 3-5-8x8
7 70' Guy Derricks, 60 to 65' Boom, Complete
2 Little Champion Drills, 2½x5¼
4 Drill Columns, 5½x7
6 Drill Column Arms with Saddle, Complete
1 No. 0 Cyclone Traction Drill, 3" Tools
1 No. 4 Cyclone Traction Drill, 5 5/8 Tools
29 7x10 Lidgerwood Engines D. C. D. D. with No. 4 Swing Gear, almost new
5 7x10 Lidgerwood Engines D. C. D. D. and Boiler, No. 4 Gear, almost new
2 7x10 American Engines, D. C. D. D. and Boiler, No. 4 Gear
1 8x13 Mundy Engine D. C. D. D. Skeleton
1 300 H. P. Corliss Engine, 16x36
10 Vulcan 10x16 Locomotives, 36 Gauge
2 Davenport 10x16 Locomotives, 36 Gauge
1 Ransome Mixer with 7x7½ upright engine
1 No. 33 Municipal Mixer and Engine on Steel Skids Complete
3 Hains Gravity Mixers
1 No. 5 Smith Mixer Engine, no Boiler
1 Road Machine
1 5 Ton Iroquois Roller
1 10 Ton Buffalo Pitts Roller.
1 American Band Saw
1 Swing Saw Wall Pattern No. 384 A.
40 4 yd. Steel Skips
100 4 yd. Wooden Skips
5 1500 Gallon Wooden Tanks
1 5500 Gallon Iron Tank
1 6000 Gallon Iron Tank
1 Power Hack Saw
1 Blacksmith Blower
2 Kotton Pneumatic Baby Stone Surfacers

PUMPS

1 Davidson 14"x8½, 6 suction 5 discharge
1 Duplex Dean Tandem Compound 9x14x14 12 suc. 10 dis.
1 Centrifugal Pump Belt Driven 8 suc. 6 dis.
1 12" Foot Valve
1 Centrifugal Pump Belt Driven 7" suc. 6" dis.
2 Blake Duplex 10x6x10 5" suc. 4" dis.
1 Blake Single Action 5½x3x6¼ 2" suc. 1½ dis.
1 Blake Duplex 4½x2¾x4 2 suc.
2 Blake Duplex 4¼x2¾x4 2 suc.
1 Blake Duplex 6x4x6, 3¼ suc. 3 dis.
3 Cameron Light Service 6x8x13, 5" suc. 4" dis.
1 Cameron No. 10 12x13 8" suc. 6" dis.
1 Cameron No. 5 3½ suc. 3½ dis.
1 Cameron No. 7 4" suc. 3" dis.
1 Cameron No. 3 A 2" suc. 2" dis.
2 Cameron No. 10 Sinking Pumps 14x9x18 6" suc. 5" dis.
1 Pulsometer No. 7 4" suc. 4" dis.
1 Pulsometer No. 6 4" suc. 3½" dis.
1 Pulsometer No. 3 2" suc. 2" dis.
1 Emerson No. 6 10" suc. 8" dis.
2 Lidgerwood Cableways 1,450 ft. with 2 engines 12¼x15 drums 60" diam. 42" long.
1 Lathe 10' bed 20" swing Whitcomb & Blaisdell Tool Co.
1 Radial drill press 33" American Tool Works
1 Standard Bolt & Pipe Cutter ¼" to 2"
1 Planer 6'x24" Lathe & Morse Tool Co.
1 Blacksmith Service Plate.
1 1000 Gallon Wickes Open Water Heater 1000 H. P. 1-8" & 1-10"
2 Smoke Stacks 66" diam. each 110 ft.
1 Smoke Stack, 60" diam. 95 ft.
1 10" Silver Upright Drill
1 10" Post Drill Press
66 Frogs for No. 60 Rail
60 Pairs of 10 ft. Switches for No. 60 Rail
12 Pairs of 15 ft. Switches for No. 60 Rail
7 Sets of 3 rail switches for No. 60 Rail
54 Tons of No. 80 Rail
80 Tons of No. 38 Rail
1200 Tons of No. 60 Rail
2 Bridge Girders 104'-6" weight 83,500
9 Bridge Girders 49'-0" Weight about 3 tons each.
1 Emery Wheel
Numerous smaller equipment of every kind.

SAND
Good native sand, for building and concreting purposes, for sale cheap.
Bradley Contracting Co.
1 Madison Ave., N. Y. City

WHEN WRITING ADVERTISERS.
Every advertiser is rather interested to know how you got his name, and we would request that when you write, you state that you secured it from the advertisement in
ENGINEERING NEWS

LOCOMOTIVES
CARS
STEAM SHOVELS
Special: 12—6 Yard Cars, 56½".
Vulcan Shovel, 1¼ yard.
2—Derrick Cars.
9 x 14 Locomotive, 36" gauge.
11 x 22 Locomotive, Standard Gauge.
60—9 Yard Dump Cars, Standard Gauge.
Prices the lowest.
MILLER & FRANCIS CO.
50 Church St., New York
25-1t

FOR SALE—Prompt Shipment
NEW AND RELAYING RAILS
of all weights, and new Frogs, Switches, Rail Braces, etc.
ROBINSON & ORR, Pittsburg, Pa.
We have for sale a number of good second-hand Locomotives.

FOR SALE.
One 10 x 12
Lidgerwood Cableway Outfit
complete; in first-class condition; ready for prompt shipment; price $1,400; f. o. b. cars, Newark, N. J.
A full line of contractor's material.
O. B. WHITNEY,
39-41 Cortlandt St., New York City.

FOR SALE
2—16 H. P., A. H. & D. Hoisting Engines with Boilers.
1—8 H. P. American D. C. S. F. D. Hoist.
2—A. H. & D. 14" Guy Derricks.
2—No. 2 Ransome Mixers with Hoppers.
2—No. 2 Smith Mixers, Gasolene Engines.
1—No. 2 Ransome Engine and Boiler.
1—No. 1 Smith Engine and Boiler.
1—No. 5K Gates Crusher.
1—No. 2" D" Gates, 30' Elevator. 24-3t
G. D. SMITH, 414 Fisher Bldg., Chicago
Send for Complete List

FOR SALE—SECOND HAND
Four Buff & Berger Transits.
Three Buff & Berger Wye Levels.
One C. L. Berger Transit.
One Gurley Plane Table, complete.
Two Compensating Planimeters.
LEDDER & PROBST,
397 Washington St.,
23-3t Boston, Mass.

TO ENGINEERS AND ARCHITECTS

"The reinforcement for concrete should be fabricated in units and the application of such unit reinforcement should become compulsory."

"Many empirical systems have been produced, consisting of units composed of loose rods and wire, loose and unsupported bars of various combinations of attached stirrups wired thereto, etc. The fact that these systems have produced buildings which have not collapsed under load is no proof of the adequacy of their reinforcement."—Quotations from a recent discussion before one of America's leading Engineering Societies on Reinforced Concrete Construction.

WHY?

First—Loose rods and bars do not insure the proper placement in concrete work. Displacement of reinforcement upward is loss of strength. Displacement down, the fire resisting qualities of the concrete are vitally impaired; also dangers from electrolysis arise.

Second—In complicated units, the formation of cavities in the concrete cannot be avoided during the process of pouring and tamping of the concrete. This fact is obvious. In such structures, what will take place under sudden **SHOCK, VIBRATION and EXCESSIVE LOADING?**

PITTSBURGH STANDARDIZED REINFORCEMENT

is a simple truss composed of top members, web members and bottom members electrically welded together and fabricated from carefully prepared drawings to meet the requirements of each individual case of loading. No empirical methods enter into the design or construction of the frame. The correct position of the frame in the work is assured, from beginning to end of the operation of pouring concrete. Observe the outline of the frame. What interference can it offer to the pouring of concrete?

TYPICAL GIRDER REINFORCEMENT

CONTRACTORS

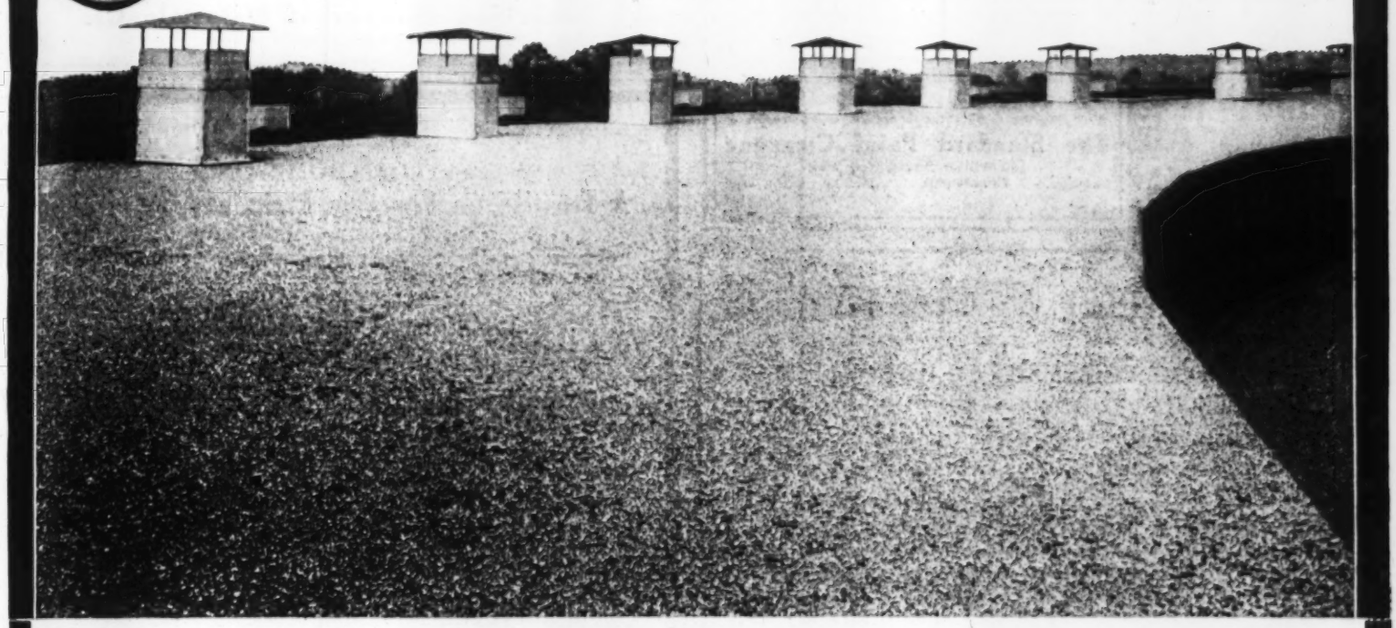
PITTSBURGH STANDARDIZED REINFORCEMENT in its various types is fabricated directly in the steel plant which produces the Medium Basic Open Hearth Steel used—a mill equipped with most modern machinery throughout and of world-wide reputation. Certainty of quality, accuracy of workmanship, and the prompt handling of shipments is thus made absolute.

PITTSBURGH STANDARDIZED REINFORCEMENT in the field means merely the operation of lifting the frames into place—nothing more. There is no interference in pouring concrete and loss from work. The labor item alone has been minimized—in many cases far in excess of 30 per cent. over hitherto prevailing methods.

PITTSBURGH STEEL PRODUCTS COMPANY

Frick Building - - - - - PITTSBURGH, PA.

Barrett Specification Roofs



Longest Wear for Lowest Cost

The cost *per year of service* is the only true test of a roofing.

It discloses the absolute superiority of Barrett Specification Roofs. That is why on large manufacturing plants where costs are carefully computed, such roofs are almost invariably used.

Barrett Specification Roofs are inexpensive, costing much less than tin for instance, and little more than the best grade of ready roofings.

And their cost of maintenance is nothing, for they require no painting; they can't rust, and they will give satisfactory protection for 20 years or more.

Insurance underwriters classify these roofs as "slow burning" construction acceptable on "fireproof" buildings.

Barrett Specification Roofs are immune from damage by acid fumes.

They are used extensively on railroad round houses. On cotton mills with their humid interiors, these roofs give perfect satisfaction for dampness does not affect them from below.

The Barrett Specification Roof illustrated above is 50,000 square feet in area and covers the Round House of the Vandalia Lines (Penn System) at Terre Haute, Ind.

We will be glad to supply a copy of The Barrett Specification on request to anyone interested in the subject. Address nearest office.

PROTECT WOODEN LOWER FLOORS AGAINST DECAY

There is a wide demand for floors with a wooden wearing surface that can be laid directly on the ground without air space beneath, and without danger of decay. This is supplied in Barrett's Tar Rok Sub-Floor construction, a great improvement over the laying of wooden floors on cement concrete. (*Timbers laid in cement concrete decay almost as quickly as if laid on the ground.*) Booklet on request.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburg Minneapolis Kansas City New Orleans Seattle London, Eng.

A GOOD PAINT
IS
A CHEAP PAINT
"SUPERIOR GRAPHITE PAINT"
IS A GOOD PAINT

May we tell you of its general use by railroad and other engineers, and why they use it for steel protection?

Won't You Write For Booklet

"WHERE IT IS AND WHY"?
It's Interesting and Instructive Reading

DETROIT GRAPHITE CO.
PAINT MAKERS
NEW YORK, CHICAGO BOSTON, DETROIT

FLEXITE
Metal Preservative
PAINTS

For ALL STRUCTURAL IRON WORK,
steel cars, bridges, etc. Protects against weather, dampness, salt air, water and corrosive gases.
Will not melt, blister or peel. Forms an absolutely moistureproof coat.
Write for prices, specifications for applying and booklet No. 57
The Standard Paint Company
100 William Street, New York
Chicago Philadelphia Boston St. Paul
Denver Kansas City

Henderson Street Station of the McAdoo Tunnel System. This station and 8,000 feet of concrete tunnel below tide level was waterproofed with

Keystone Waterproofing
which is a water repellent powder that is added to the concrete during mixing.
LOGICAL—Because the entire mass is made watertight—not the outside or inside.
ECONOMICAL—Because it is lowest in FIRST COST, which is LAST COST, because there is no cost for mixing—Application—Protection walls or extra excavation.
PERMANENT—Because it becomes a part of the structure itself and will last as long as the concrete which it enters. Can be used with economy anywhere cement is used.
New catalog just issued. Send for it.
Harrison Waterproof Materials Co.
32 Church Street, New York City

Venturi Meter
Patented

VENTURI METER TUBE

FOR THE MEASUREMENT OF HOT WATER

The entire absence of mechanism or projections within the Venturi Tube, which is the only part through which the water flows, makes this type of meter ideal for measuring hot water. There are no parts to become warped by high temperatures or to become clogged by sediment. The throat of the meter tube is lined with bronze carefully machined to the correct diameter and contour. Hence the initial accuracy of the Venturi Meter remains unchanged during years of service.

BUILDERS IRON FOUNDRY, - Providence, R. I.

SECOND EDITION, REVISED AND ENLARGED
Total Issue, Eleven Thousand
TAYLOR-THOMPSON'S
A Treatise on Concrete, Plain and Reinforced
xl + 807 pages, 8vo. Cloth, $5.00.

SECOND EDITION, REVISED AND ENLARGED
Total Issue, Eight Thousand
TURNEAURE-MAURER'S
Principles of Reinforced Concrete Construction
8vo. Cloth, $3.50.

JOHNSON-SMITH—**The Theory and Practice of Surveying.** Designed for the Use of Surveyors and Engineers Generally, but Especially for the Use of Students in Engineering. By J. B. JOHNSON, C.E. Seventeenth Edition, Rewritten and Enlarged. By LEONARD S. SMITH, C.E. Total issue Thirty-seven Thousand. Small 8vo, xxxii+921 pages, 263 figures, 7 plates. Cloth, $3.50 net.

BREED-HOSMER—**The Principles and Practice of Surveying.** In two volumes.
Vol. I. **Elementary Surveying.** Second Edition. 8vo, xviii+540 pages, 195 figures. Cloth, $3.00.
Vol. II. **Higher Surveying.** 8vo, xvii+432 pages, 162 figures. Cloth, $2.50.

MERRIMAN-BROOKS—**Handbook for Surveyors.** 16mo, 246 pages. Morocco, $2.00.

NUGENT—**Plane Surveying.** 8vo, xvi+583 pages, 325 figures. Cloth, $3.50.

TRACY—**Exercises in Surveying for Field Work and Office Work.** With Questions for Discussion. Intended for Use in Connection with the Author's Book, "Plane Surveying." 12mo, xvi+169 pages. Morocco, $1.00 net.

TRACY—**Plane Surveying.** A Textbook and Pocket Manual. 16mo, xxvii+792 pages, illustrated with line cuts. Morocco, $3.00.

JOHN WILEY & SONS
43 and 45 East 19th Street, New York City
London, CHAPMAN & HALL, Ltd. Montreal, Can., RENOUF PUB. CO.

THE ROEBLING SYSTEM OF FIRE PROOFING
Send for Catalogue
The Roebling Construction Co., 32nd Floor, Metropolitan Tower, New York

---

High Grade **PUMPS** Vacuum Boiler Feed
Pressure and Tank Service
Condensers, Feed Water Heaters, Water Cooling Apparatus
C. H. WHEELER MFG. CO.
New York PHILADELPHIA Chicago
Boston San Francisco

THE PUMP SLIP INDICATOR
Makes your engine counter a perfect meter by showing the proper correction for slip. *The Portable Test Pitometer* will measure flow in pipes at *any time, anywhere!* Stop leaks and steals! Write for information.
THE PITOMETER COMPANY, 220 Broadway, New York

TURNBUCKLES

CLEVIS NUTS

CLEVELAND CITY FORGE & IRON CO.
CLEVELAND, OHIO
Branch Office: 11 Broadway, New York

ALUMINUM
Ingots, Sheets, Wire, Rods, Castings
Aluminum Wire and Cables (bare and insulated) for Electrical Conductors.
Aluminum Company of America
Pittsburgh, Pa.
Formerly The Pittsburgh Reduction Co.

The Cutler Mail Chute
"The cheapest modern improvement."
For circulars and full particulars address sole makers,
CUTLER MAIL CHUTE COMPANY,
Rochester, N. Y.
Infringers are under injunction

THE "ONE-PIECE" TURNBUCKLE

Manufactured by
MERRILL BROS., Maspeth, New York, N. Y.

NEW YORK STATE EDUCATION BUILDING.

Albany, N. Y.

Sealed proposals will be received by the Secretary of the Trustees of Public Buildings in the Executive Chamber, the Capitol, Albany, N. Y., up to 12 o'clock noon, January 24th, 1911, for (1) The Electric Lighting Fixtures, (2) The Metal Book Stacks and Metal Cases, (3) The Wood Book Cases, (4) The Electric Wiring for Book Stacks and Book Cases and Extension to Existing Plant, (5) The Elevators and Book Lifts, (6) The Glazed Grilles and Miscellaneous Ornamental Iron and Bronze Items, and (7) The Interior Decoration, for the New York State Education Building, situated on the north side of Washington Avenue, extending from Hawk Street to Swan Street, in the City of Albany, N. Y.; and opened publicly by the Trustees of Public Buildings in the Executive Chamber. A separate and distinct proposal is required for each of the seven items of work for which proposals will be received. Each proposal shall be accompanied by a certified check or cash deposit to the amount of 5% of the amount of the proposal. The Trustees of Public Buildings reserve the right to reject any or all proposals received if they consider it to the best interests of the State to do so. The Surety required to guarantee the faithful performance of the work will be one or more bonds executed by one or more guarantee or surety companies aggregating in amount 50% of the amount of the contract. The bond or bonds shall be executed within thirty (30) days from the date of award of the contract. If the surety or sureties shall not execute the bond or bonds; or if the sureties offered by the Contractor are not approved by the Trustees of Public Buildings, and other sureties are not provided acceptable to the Trustees of Public Buildings, the Contractor will be considered as having abandoned his bid. In event of such default on the part of the Contractor the deposit made by him shall be forfeited and retained by the State of New York as liquidated damages because of such default; the notice of award will be deemed cancelled and the State will be under no obligation to pay the Contractor for any work done and performed by him.

Contractors submitting proposals for Metal Book Stacks and Metal Cases are required to erect in the New York State Education Building a sample Stack which sample is to be delivered and erected at or before the time fixed for the receipt of the proposals.

Contractors submitting proposals for Electric Lighting Fixtures are required to deliver certain sample fixtures at the office of the Architects, Palmer & Hornbostel, at the corner of Washington Avenue and Hawk Street, Albany, N. Y., at or before the time fixed for the receipt of the proposals.

On and after December 20, 1910, the drawings and specifications, the form of contract, the bond, and blank forms for proposals, may be obtained at the office of the Architects, Palmer & Hornbostel, No. 63 William Street, New York, N. Y. One set of drawings, specifications, etc., will be furnished Contractors intending to submit proposals for any one of the seven items of work, on application to the Architects and upon the payment of a deposit of $50.00, this deposit to be forfeited if the drawings and specifications are not returned to the Architect in good order before February 15, 1911. Additional copies will be furnished upon the payment by the Contractor of the net cost of the same. Plans and specifications will be supplied the Sub-contractors wishing to submit to Contractors figures for the various departments of work, upon reasonable notice to the Architects and payment of the net cost of the plans and specifications required.

By order of the Trustees of Public Buildings,

FRANKLIN B. WARE,
State Architect,
The Capitol, Albany, N. Y.

PROPOSALS FOR BRIDGE.—U. S. Engineer Office, Vicksburg, Miss., Dec. 15, 1910.—Sealed proposals for steel hull, self-propelling hydraulic dredge, steel pontons and pipe line, and also for the component groups thereof, including steel dredge hull, steel pontons and pipe line, upper works, steam plant, propelling machinery, electric plant, pumping engine, condenser plant and evaporator, sand pump, suction pipe and ladder, cutter head, gear and engine, winches and refrigerating plant, will be received at this office until 12 M., Jan. 18, 1911, and then publicly opened. Information on application. CLARKE S. SMITH, Capt., Engrs.

Automatic Air Lock and Siphonic Apparatus
OF EVERY DESCRIPTION
(Miller & Adams' Patents)
For Operating Bacterial Sewage Filters, Septic Tank System of Sewage Disposal
TAYLOR NOZZLE AND RISER
For Percolating Filters
ALSO THE
Miller, Miller-Potter, Rhoads-Miller and Rhoads-Williams
AUTOMATIC SIPHONS
For Intermittent Flush Tanks—for Flushing Street Sewers
NO MOVING PARTS IN ANY OF OUR APPARATUS
Send for Illustrated Catalogue
PACIFIC FLUSH TANK COMPANY
THE TEMPLE, 184 LaSalle Street, CHICAGO
Eastern Office, 149 Broadway, Singer Building
Canadian Agent, VICTOR HILL, C. E. P. O. Box 245 Niagara Falls, Ontario

RIVETED STEEL PIPE For Water, Gas, Sewers, Culverts, Penstocks, Air and Hydraulic Mining, Bridge Caissons, Girders, Smoke Stacks, Cupolas, Stand Pipes. **TANKS**
THE CARROLL-PORTER BOILER & TANK CO., PITTSBURG, PA.

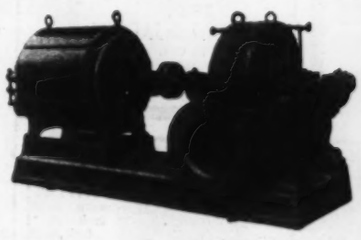
THE T. A. GILLESPIE COMPANY Engineers and Contractors
Manufacturers of Riveted Steel Pipe PITTSBURG OFFICE, Westinghouse Building NEW YORK OFFICE, 50 Church Street

"MACK" LEADING GASOLINE TRUCK OF AMERICA
Cut shows 7-ton Contractors' Truck; dumps load in two minutes. Capacity, 5 yards sand, gravel, stone or brick. Built in all styles and sizes. Ask for Catalog EE, showing 100 satisfactory installations.

ADVANTAGES
Motive power more effective, positive, and flexible; hence, more economical.
Cuts operating cost one-half; makes all hills level roads.
Can be backed into any corner, or up any grade instantly.
Eliminates problem of feed supply.
Takes double load—twice as fast—WITH ONE DRIVER, 2 x 2=4.
Adaptable to rush, normal or vacation periods.

MACK BROS. MOTOR CAR CO.
NEW YORK CITY Sales Office and Show Room 30 Church St., Suite 621
Main Office and Shops ALLENTOWN, PA.
CHICAGO 1423 McCormick Building

12 INCH CENTRIFUGAL PUMP FOR SEWERAGE HANDLING



¶ Single or double suction pumps. ¶ Split cases on all horizontal pumps, facilitating rapid examination. ¶ Horizontal or vertical pumps designed and built for special conditions. ¶ Bearings, ring oiling and separate from stuffing boxes. ¶ High efficiency.

THE LATHBURY-D'OLIER COMPANY
ENGINEERS
Morris Building, Philadelphia New York, 114 Liberty Street

OFFICE OF THE CONSTRUCTING QUARTERMASTER, Madison Barracks, Sackets Harbor, New York, December 9, 1910.—Sealed proposals, in triplicate, will be received at this office until 2.00 p. m., Monday, January 9, 1911, and then opened for the construction of forage store house at this post. Plans and specifications may be seen at the Office of the Chief Quartermaster, Department of the East, Governor's Island, New York. Information on application to this office. The United States reserves the right to reject any or all bids or any part thereof. Deposit of $10.00 required to guarantee return of plans and specifications. Envelopes containing proposals should be smarked "Proposals for Forage Store House, to be opened 2:00 p. m., January 9, 1911," and addressed to the Constructing Quartermaster, Madison Barracks, Sackets Harbor, New York.

BRIDGE.

Portland, Ore.

Sealed proposals addressed to the Mayor and Executive Board of the City of Portland, Oregon, for the building of the substructure of a bridge over the Willamette River on a westerly extension of Broadway Street in said city, will be received up to noon of Friday, December 30, 1910.

Plans, specifications and bidding papers will be on file in the City Engineer's office at Portland or may be obtained from Ralph Modjeski, Monadnock Building, Chicago, Illinois, by sending with order a guaranteed deposit check of twenty-five dollars, which amount will be refunded later if papers be returned in good order.

All tenders are to be sealed and marked on the outside, "Tenders for Substructure of Broadway Bridge."

No proposal or bid will be considered unless accompanied by a check payable to the order of the Mayor of the City of Portland, certified by a responsible bank, for an amount equal to 10 per cent. of the proposal, to be forfeited as fixed and liquidated damages in case the bidder neglects or refuse to enter into contract and provide a suitable bond for the faithful performance of said work in the event the contract is awarded to him.

The city reserves the right to reject any and all bids.

By order of the Executive Board.

A. L. BARBUR.
Auditor of the City of Portland.

SEWERAGE SYSTEM.

Buffalo, Wyoming.

Sealed proposals will be received by the Mayor and Board of Trustees of the City of Buffalo, Wyoming, up to 8.00 o'clock P. M., Mountain Time, of the 6th day of January, 1911, for furnishing all the materials and labor of all kinds necessary for the construction of a system of sewerage in said city of Buffalo, Wyoming. All proposals must be made on the blank forms furnished for such purpose by the city; and must be accompanied by a certified check for $1,000.00, drawn on some Buffalo, Wyoming, bank and made payable to the Treasurer of the City of Buffalo.

There will be required about 6,390 linear feet of 6-inch pipe sewer; 11,540 linear feet of 8-inch pipe sewer; 1,910 linear feet of 10-inch pipe sewer; 4,840 linear feet of 12-inch pipe sewer; 700 linear feet of 15-inch pipe sewer; each with necessary house connections; 51 manholes; 15 flush tanks; 22 lamp holes; outlets, and other appurtenances as may be needed. The minimum depth is 5 feet, the maximum depth is 18 feet, the average depth is 9 feet.

Plans, specifications, blank form for proposal, and full instructions to bidders, may be obtained upon application therefor to Hayden M. White, City Clerk of Buffalo, Wyoming; and the payment therefor of the sum of $5.00 as a guarantee of good faith and to insure their return in good order.

E. L. CLARKE,
Engineer in Charge.

SEWERS.

Fordyce, Ark.

Sealed bids will be received for the construction of approximately six miles of Sanitary Sewers, almost entirely eight inch, 89 manholes, eight flush tanks and two sewage disposal tanks, included in Sewer District number one, Fordyce, Ark., at the office of the Commissioners for said district at Fordyce, Ark., on Monday, January 2nd, at 3 P. M. Each bid must be accompanied with a certified check for $500.00.

Bond will be required from the successful bidder in the sum of $10,000.00.

The right is reserved by the commissioners to reject any and all bids.

Plans and specifications can be obtained from the Engineer for the district, Wm. J. Parkes, 107½ Main St., Pine Bluff, Ark.

U. S. ENGINEER OFFICE, New York, N. Y., Dec. 5, 1910.—Sealed proposals for dredging in Bay Ridge Channel, New York Harbor, will be received at this office until 12 M., Jan. 5, 1911, and then publicly opened. Information on application. S. W. ROESSLER, Col., Engrs.

For other
PROPOSAL ADVERTISEMENTS
See pages 51, 52, 55, 56, 58 and
Construction News, page 316.

The Best for the U. S.

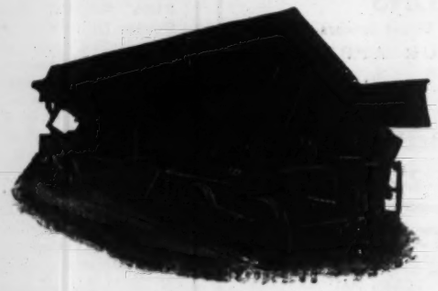
The Government, in strong competition, decides in favor of

The Oliver 19 yd. Air Dump Car

and orders 250

(This order was increased to 300 after the excellent construction of this type of car was fully gone into.)

300 MEANS APPROVAL, NOT TRIAL



The Oliver Air Dump Car

is the simplest, most efficient and economical car of its class on the market, because the power is directly applied to the car body and all chains, sheaves and shafts are eliminated. A recent test on railroad construction work showed it capable of dumping towards the high side of a curve, a maximum load heaped as high as possible on the opposite side of the car. The ease in handling such a load and the quick response of the air mechanism under normal train pipe air pressure, showed the ample power and efficiency of that feature of the car.

It is the high standard of Oliver equipment that has always counted.

Manufactured by

The Wm. J. Oliver Mfg. Co., Knoxville, Tenn.

SELLING AGENTS: L. E. Otte Co., 508 Monadnock Block Chicago, Ill.

Henry J. McCoy Company, 67 Day Street, New York, N. Y.

The Cincinnati Equipment Co., Pennsylvania Building Philadelphia, Pa.

Cast Iron Sectional

SPIRAL STAIRS

40" to 72" diameter

Shipped all ready to set up

We also make

Portable Hydraulic Presses

for all purposes

Raquette Foundry & Supply Co.

Massena, N. Y., U. S. A.

"K & J"
No. 9X

Weight 126 lbs.

Its Weight is a Good Guide to its Strength

"K & J" Barrows are always dependable

Get Catalogue 35-F

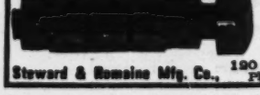
THE KILBOURNE & JACOBS MFG. CO.

COLUMBUS, OHIO, U. S. A.

New York Offices, 25 Broad St.

676

EXPANSION & TOGGLE BOLTS For fastening all kinds of material to stone and brickwork. Send for Catalogues.



Steward & Romaine Mfg. Co., 120 N. 6th St. Phila., Pa.

WHEN WRITING ADVERTISERS.

Every advertiser is rather interested to know how you got his name, and we would request that when you write, you state that you secured it from the advertisement in

ENGINEERING NEWS

BRIDGE.

Peoria, Ill., December 19, 1910.

Public notice is hereby given that sealed bids will be received by the Commissioner of Public Works of the City of Peoria, Illinois, up to 8:00 P. M., on December 30th, 1910, for the building of a Bridge across the Illinois River at Bridge Street in said City of Peoria, and for the removal of piers, piling, an old wooden bridge and the debris of a fallen Reinforced Concrete Bridge, from the site of said new Bridge.

Parties desiring to bid upon this work may obtain from the Commissioner of Public Works of the City of Peoria a complete set of plans and specifications upon written application therefor and the payment of five dollars ($5.00); bids must be in accordance with said plans and specifications. The said plans and specifications are on file in the office of the Commissioner of Public Works and are open to public inspection.

Each bidder must accompany his bid with a certified check, drawn on some responsible bank in the City of Peoria and made payable to Geo. F. Simmons, Commissioner of Public Works, in the sum of Ten Thousand Dollars ($10,000), guaranteeing that, should he be awarded the contract, he will enter into said contract within ten (10) days after same is awarded, and that he will furnish the said Commissioner of Public Works a satisfactory surety company bond in the sum of One hundred thousand dollars ($100,000).

The price must be written in the bid and also stated in figures and all bids will be considered informal which contain items not specified in form of bids, and if any discrepancies occur between the written and figured prices, those not favorable to the city will be taken as the intention of the bidder.

Bidders are required to state in their bids their names and places of residence and the names of all persons interested with them, and if no other person so interested, they shall distinctly state the fact.

Proposals must be submitted on the blanks bound with specifications and enclosed in a sealed envelope addressed to George F. Simmons, Commissioner of Public Works, Peoria, Ill., and be endorsed "Proposal for Bridge Street Bridge."

GEO. F. SIMMONS,
Commissioner of Public Works,
of the City of Peoria, Illinois.

TREASURY DEPARTMENT, Office of the Supervising Architect, Washington, D. C., December 16, 1910.—Sealed proposals will be received in this office until 3 o'clock P. M., on the 25th day of January, 1911, and then opened, for the construction complete (including plumbing, gas piping, heating apparatus, electric conduits and wiring), of the United States Post Office at Stevens Point, Wisconsin, in accordance with drawings and specifications, copies of which may be obtained from the custodian of site at Stevens Point, Wisconsin, or at this office, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect.

U. S. ENGINEER OFFICE, Cincinnati, O., Dec. 5, 1910.—Sealed proposals for construction of 3 steel flatboats and 3 steel barges will be received here until 12 M., Jan. 4, 1911, and then publicly opened. Information on application. JOHN C. OAKES, Maj., Engrs.

POSTPONEMENT OF OPENING BIDS FOR THE PORTO RICO IRRIGATION SERVICE.

The opening of sealed proposals for the construction of (1) Carite Dam, (2) Guayabal Dam, and (3) Patillas Canal and Appurtenant Structures, is hereby postponed from January 3, 1911, to February, 7, 1911.

J. W. BEARDSLEY,
Chief Engineer, Irrigation Service,
Guayama, Porto Rico.

By order of
JOHN A. WILSON,
Commissioner of the Interior,
San Juan, Porto Rico.

U. S. ENGINEER OFFICE, Jacksonville, Fla., Dec. 5, 1910.—Sealed proposals for dredging in Sarasota Bay, Fla., and sale of dredge "Suwanee" will be received at this office until 12 M., Jan. 5, 1911, and then publicly opened. Information on application. GEO. R. SPALDING, Capt., Engrs.

DAMS AND CANAL.

DEPARTMENT OF THE INTERIOR, OFFICE OF PORTO RICO IRRIGATION SERVICE.

Guayama, P. R., October [illegible], 1910.

Sealed proposals will be received at the office of the Commissioner of the Interior of Porto Rico until 2 o'clock P. M., February 7th, 1911, for the construction of—

(1) Carite Dam and appurtenant structures, containing about 150,000 cubic meters of earth and loose rock, the estimated cost of which is about $190,000.

(2) Guayabal Dam and appurtenant structures, containing about 7[illegible],500 cubic meters of concrete masonry and 82,000 cubic meters of excavation, the estimated cost of which is about $550,000.

(3) Patillas Canal and appurtenant structures, including about 3[illegible],000 cubic meters of open-cut excavation, [illegible],090 lineal feet of tunnels, 2,500 lineal feet of flumes, 600 lineal feet of siphons, and [illegible] bridges, the estimated cost of which is about $70,000.

Plans and specifications may be obtained from this office, or from the Commissioner of the Interior, San Juan, Porto Rico, or from the Bureau of Insular Affairs, Washington, D. C.

A deposit of $2 is required for each set of plans, which will be refunded upon the return of the plans upon or prior to the date set for opening the bids. The right is reserved to reject any and all bids.

J. W. BEARDSLEY,
Chief Engineer Irrigation Service,
Guayama, P. R.

By order of:
JOHN A. WILSON,
Commissioner of the Interior of Porto Rico, San Juan P. R.

ASSISTANT ENGINEER.

299 Broadway.

New York, N. Y., Dec. 21, 1910.

PUBLIC NOTICE IS HEREBY GIVEN that application will be received from WEDNESDAY, DECEMBER 21, UNTIL 5 P. M., FRIDAY, JANUARY 6, 1911, for the position of

ASSISTANT ENGINEER, BUREAU OF BUILDINGS (GRADES D & E).

No application delivered at the office of the Commission, by mail or otherwise, after 5 P. M., January 6, 1911, will be accepted.

The examination will be held on Friday, February 3, 1911, at 10 A. M.

The subjects and weights are: Technical, 5; Experience, 3; Mathematics, 1; Report, 1. 75% required on technical paper and 70% on all.

Candidates must be civil engineers of at least three years' experience (chapter 386 of the Charter).

Candidates should be familiar with the best modern practice of all structural details of important building construction and have a knowledge of the fundamental requirements of the Building Law. They should have had experience in the executive control of a number of technical employes and general business relations with non-technical men.

Vacancies: 3 in Bureau of Buildings at $2,400 per annum, and 6 at $1,800 per annum.

Minimum age, 25 years.

F. A. SPENCER,
Secretary.

DEPARTMENT OF THE INTERIOR, United States Reclamation Service, Washington, D. C., December 21, 1910.—Sealed proposals will be received at the office of the United States Reclamation Service, Belle Fourche, S. Dak., until 3 o'clock p. m., February 24, 1911, for the earthwork on about 22 miles of the North Canal, involving the excavation of approximately 770,000 cubic yards of material. For particulars address the United States Reclamation Service, Washington, D. C., Denver, Colo., or Belle Fourche, S. Dak. R. A. BALLINGER, Secretary.

SEALED PROPOSALS will be received at the office of the Light-House Inspector, Philadelphia, Pa., until 12 o'clock M., January 24, 1911, and then opened, for rebuilding wharves, retaining walls, etc., at Edgemoor Light-House Depot, Del., in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to the Light-House Inspector, Philadelphia, Pa.

For other PROPOSAL ADVERTISEMENTS See pages 51, 52, 55, 56, 58 and Construction News, page 316.

HIGH-GRADE FIRE BRICK

A good article is worth its price—Our No. 1 are No. 1
Recollections of quality remain long after matter of price is forgotten.

HENRY MAURER & SON, 422 East 23d St., New York

AURORA DUMP WAGON

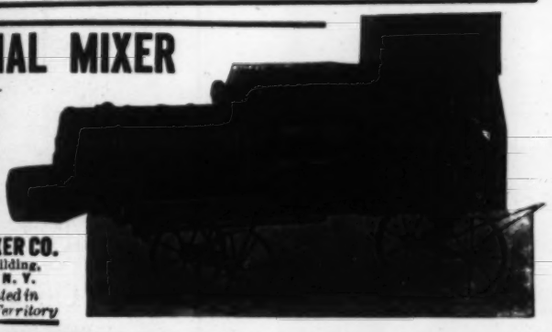
SPECIAL FEATURES:

Lightest possible construction consistent with requisite strength. Slotted hinge. Built low. Large discharge opening. Short coupled. Chains outside of bed. Direct pull of chain on doors. Length of chains adjustable. Jointed king bolt. Roller bearing fifth wheel. Spring tongue support.

Catalog of Earth and Stone Handling Machinery on Application.

WESTERN WHEELED SCRAPER COMPANY
AURORA, ILLINOIS

NATIONAL MIXER



dependable for reinforced concrete. Our force plunger feed measures accurately. Our drum mixes like a batch mixer. Will save you money on any job. Send for catalog and price.

NATIONAL MIXER CO.
402 Powers Building,
ROCHESTER, N. Y.
Live Agents Wanted in Unoccupied Territory

Sewage Disposal Plant, Essex Falls, N. J.

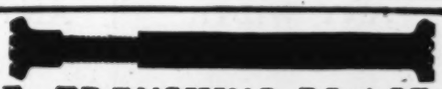
Automatic Sewage Disposal Apparatus

"Aerlock" and "Priestman-Beddoes" Systems of Control. Endorsed and adopted by leading State Boards of Health and leading Consulting Engineers.

No Moving Parts. Simple and Lasting Construction. Easily Installed
Write for particulars

MERRITT & COMPANY New York Boston
123 N. Front St., Camden, N. J. Kansas City Chicago
Also Manufacturers of Priestman Sewage Ejectors, Water Power Sewage Lifts, Merritt Water Saving Flush Tanks, Merritt Aerlock Alternating and Sequence Siphons.

This is the Best



EXTENSIBLE TRENCHING BRACE
Prompt Shipments Write for Prices **KALAMAZOO FOUNDRY & MACHINE CO.,** 598 E. Main Street Kalamazoo, Mich.

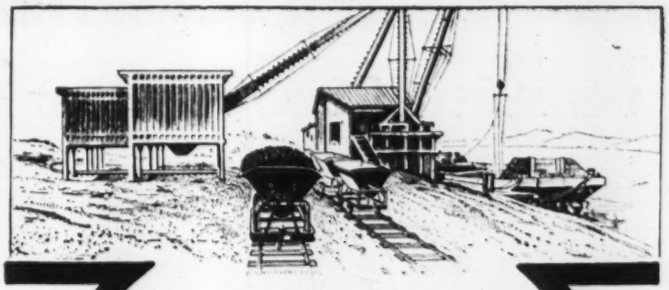
Garbage Disposal Plants

DRYERS, CONDENSERS AND PERCOLATORS
ELEVATORS, CONVEYORS AND TANKS
Complete Plants for Large or Small Cities

THE C. O. BARTLETT AND SNOW CO.
Cleveland, Ohio, U. S. A.

LEWIS & KITCHEN, Engineers and Contractors for the Designing and Construction of
GARBAGE CREMATORIES
SEPTIC TANKS SEWAGE DISPOSAL WORKS
901 Broadway, Kansas City, Mo. 1200 Michigan Ave., Chicago, Ill.

SEWER PIPE
NATIONAL FIRE PROOFING COMPANY
FULTON BUILDING-PITTSBURGH, PENN.



THE problem of economically transporting coal, gravel, sand, etc., has been most successfully solved by means of Industrial Railways (Wiener Tracks and Cars). If this were not a fact, why would

Westinghouse, Church, Kerr Co. **Raritan Ridge Clay Co.**
Acme Engineering Co. **Rose Brick Co.**
Belmont Stone Co. **Iowa Brick Co.**

and many others now be using Wiener equipment?

We carry a large stock of rails, portable track, frogs, switches, turntables, cars, etc. (Special material built to order)—we can make prompt shipments and name attractive prices.

The Blue Booklet should interest you. Write for it and Catalogue 85.

RAILROAD SPECIALISTS FOR ALL INDUSTRIES.
ERNST WIENER COMPANY
472 Hudson Terminal Building
NEW YORK, N. Y.

Boston
Philadelphia
Petersburg, W. Va.
Denver, Colo.
Los Angeles
San Francisco
Mexico City, Mexico
Toronto, Ont., Can.

Agents for Industrial Locomotives of the Baldwin Locomotive Works.

Repairs to Broken Rolls and Pinions

Finished Weld, Showing Metal Left in Gate and Riser

The Thermit Process permits of repairing broken rolls in steel plants at a fraction of the cost of buying new rolls.

Thermit is in general use by the largest steel works in the country for this purpose.

The process also offers great advantages for repairing crank shafts, gear wheels, fly-wheels, locomotive frames and all other wrought iron and steel sections.

Full information in Pamphlet No. 14-T.

GOLDSCHMIDT THERMIT COMPANY
WM. O. CUNTZ, Gen. Mgr.
90 West St., New York
432-438 Folsom St., San Francisco, Cal. 103 Richmond St., W. Toronto, Can.

Jim Fellowes Talk

With dumping wagons it all simmers down to SERVICE on the job—after all has been said and done. I know hundreds of contractors who have used their Watsons five, eight and ten years. That's service, isn't it? Good reasons for this. Write for information.

WATSON WAGON COMPANY
Canastota, New York

BRANCH OFFICES:
256 Broadway, NEW YORK CITY 604 Witherspoon Bldg., PHILADELPHIA, PA.
806 Renshaw Bldg., PITTSBURG, PA.

To Reduce Seepage in Irrigation Ditches

Ditch Being Dug with Sloping Banks—An Austin Drainage Excavator Ditch showing variations in width made by same machine

Send for Catalogue C

OUR FULL LINE COMPRISES:

The Austin Drainage Excavator
The Austin Levee Builder
The Austin Drag Line Excavator
The Austin Side Hill Ditcher
The Austin Highway Ditcher
The Austin Orange Peel Ditcher
The Austin Rolling Platform Traction
The Austin Tile Ditcher
The Austin Stump Puller and Grubber

two precautions must be taken: (1) not to disturb the original soil beyond the ditch sides and bottom; (2) To line the ditch with impervious material.

An Austin Drainage Excavator carves a ditch from the original soil to exact shape and dimensions—clean and smooth, so that it can be lined without trimming or shaping, and without templets. It digs in one operation a ditch with sloping sides, wide berms, even spoil banks, and true to grade, at a unit cost cheaper than a similar ditch can be dug by any othe method.

Because of these things, the Austin Drainage Excavator is the most perfect irrigating ditch machine known.

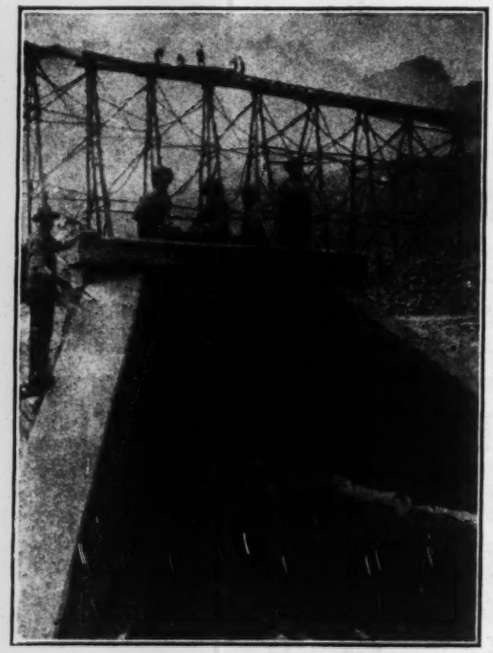
A Ditch That Was NOT Dug with Sloping Banks—This Is NOT An Austin Drainage Excavator Ditch

WE SELL OUTRIGHT OR LEASE DRAINAGE MACHINERY

F. C. AUSTIN DRAINAGE EXCAVATOR COMPANY, Railway Exchange, Chicago, Ill.

AGENTS WANTED IN UNOCCUPIED TERRITORY.

For Railroad Construction Blaw Steel Forms



H. J Collier, Western Maryland Railroad—Blaw Forms Used

are of the utmost value. Contractors who know us don't bother about forms.

They let our expert form men design their forms, and we save them money. Blaw forms are being used on 75 railroad contracts.

There's a reason—the saving is enormous.

STEEL FORMS FOR EVERY TYPE OF CONCRETE CONSTRUCTION

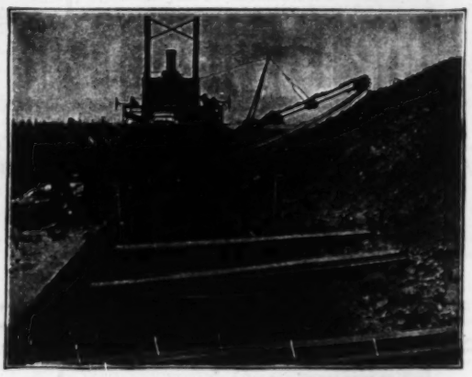
Blaw Collapsible Steel Centering Co.

General Offices: Westinghouse Bldg., Pittsburg
New York, Park Row Bldg.

Parsons Trench Excavator

ANY WIDTH ANY DEPTH
ANY SOIL

ONE MACHINE NO CHANGE OF PARTS



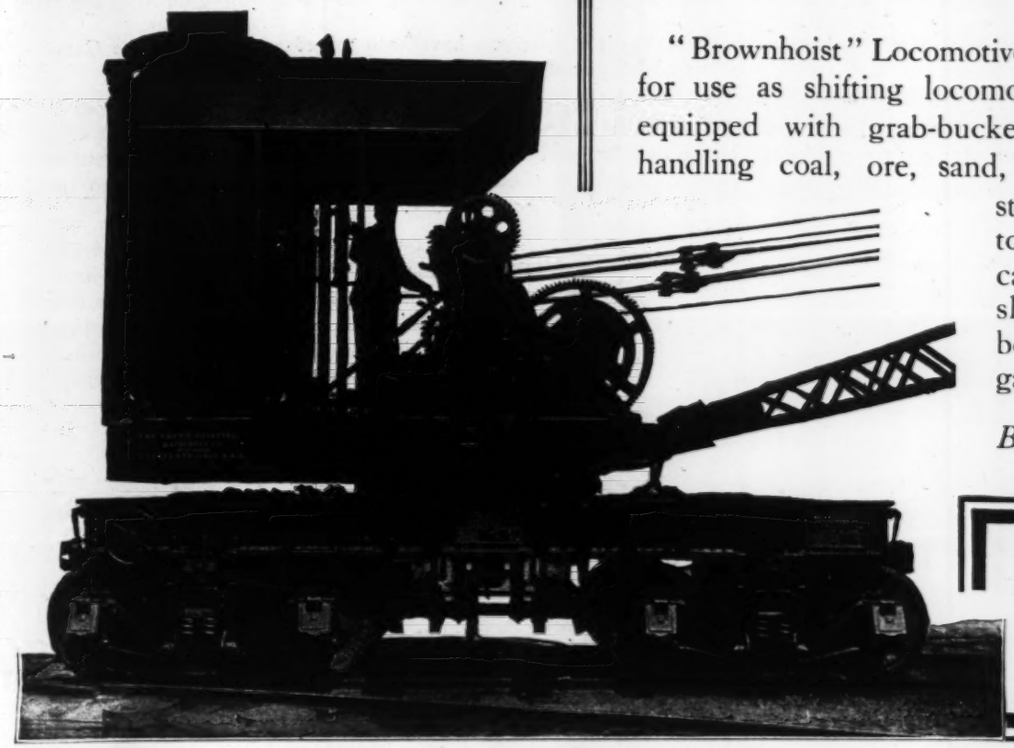
PARSONS EXCAVATOR, MILWAUKEE, WIS.

The PARSONS TRENCH EXCAVATOR has for several years been recognized as the standard. It has always kept in the lead. Its record for low cost of excavation, its speed and its adaptability to all soils, all conditions and all sizes of trenches have not been equaled. It will merit your investigation.

GEO. L. LAMBERT, Sales Manager

THE G. L. PARSONS COMPANY, Newton, Iowa

"BROWNHOIST" LOCOMOTIVE CRANES



"Brownhoist" Locomotive Cranes are adaptable for use as shifting locomotives. They can be equipped with grab-buckets for digging and handling coal, ore, sand, etc. Made in five standard sizes of three to twenty tons lifting capacity, with long or short variable-radius booms and for any gauge of track.

Better ask for Booklet.

The Brown Hoisting Machinery Co.,
Cleveland, Ohio.
Branch Offices
New York Pittsburg

HIGHWAYS.

Albany, N. Y.

NOTICE TO CONTRACTORS:—STATE OF NEW YORK, Office of the State Commission of Highways, Albany, N. Y.—Pursuant to the provisions of Chapter 30, Laws of 1909, sealed proposals will be received by the undersigned at their office, No. 55 Lancaster St., Albany, N. Y., at one o'clock P. M., on Monday, the 9th day of January, 1911, for the improvement of the following highways:

County.	Highway No.	Name.	Approximate Miles.
Albany	790	Coboes City Line-Boghts Cor.	2.17
Albany	879	Shakers-Watervliet	6.40
Broome	858	Whitneys Point-Upper Lisle	4.27
Cattaraugus	695	Otto-Cattaraugus	1.21
Cattaraugus	697	Otto-E. Otto-Section II.	2.27
Cayuga	687	Fair Haven-Sterling-Martville	5.30
Chautauqua	873	Brockton-Stockton	2.93
Chenango	666	Plymouth-Kirk	4.90
Clinton	777	Plattsburg-Cadyville	4.33
Columbia	763	Hollowville-Crarysville	7.14
Columbia	5072	Livingston-Hudson, Part I.	3.60
Columbia	5073	Livingston-Hudson, Part II.	5.10
Columbia	5074	Schodack Ctr.-Valatie, Part IV.	4.30
Dutchess	712	Amenia-Sharon Sta.	2.29
Franklin	884	Malone-Fort Covington, Part 1.	3.58
Franklin	885	Moira-South Bombay	8.58
Franklin	5076	Malone-Moira	5.22
Jefferson	625	Theresa-Antwerp, Part 2.	5.37
Jefferson	626	Burrs Mills-S. Champion	4.56
Rensselaer	659	Brunswick Ctr.-Lansingburg	5.01
Rensselaer	679	W. Stephentown-Stephentown Center.	4.14
Rensselaer	680	Stephentown Center-Massachusetts	3.92
Rensselaer	5084	Schodack Center-Valatie, Part 3.	2.90

Alternate proposals will also be received by the undersigned at the time and place above mentioned for State Highways 5072 and 5073 combined in one contract and also alternate proposals for State Highways 5074 and 5084 combined in one contract as follows:

County.	Road No.	Name of Road.	Approximate Length Miles.
Columbia	5072-Ext.	Livingston-Hudson, Parts 1 and 2.	8.70
Columbia & Rensselaer.	5074-Ext.	Schodack Ctr.-Valatie, Parts, 3 and 4.	7.20

The Commission reserves the right to award contracts for State Roads 5072, 5073, 5074 and 5084 in the manner which shall be deemed most advantageous to the State, namely: either on separate proposals for Roads 5072 and 5073 or on proposals for these two roads combined, and in the same manner on separate proposals for Roads 5074 and 5084 or proposals for these two roads combined.

Sealed proposals will also be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at one o'clock P. M., on Wednesday, the 11th day of January, 1911, for the improvement of the following highways:

County.	Highway No.	Name of Road.	Approximate Miles.
Greene	886	Lexington-Prattsville.	4.19
Greene	887	South Cairo-Cairo	3.15
Genesee	5090	East Pembroke-Pembroke, Part II.	4.77
Hamilton	974	Nobleboro-Morehouseville	5.00
Lewis	5077	Martinsburg-Turin	3.08
Madison	883	De Ruyter-Otselic, Part I.	2.14
Madison	5078	Wampville-Oneida Castle	2.56
Montgomery	409	Fort Plain-Starkville	6.22
Oneida	837	Waterville-Deansboro	4.77
Oneida	838	Saquoit	0.50
Oneida	839	Augusta-Knoxboro	1.21
Oneida	840	North Brookfield-Waterville	4.87
Oneida	877	Clinton Village	0.97
Oneida	5079	Clayville Village	1.44
Onondaga	566	Manlius-Chittenango	3.22
Onondaga	567	Vesper-South Onondaga	6.19
Onondaga	955	Jordan-Cross Lake	1.78
Onondaga	969	Pompey-Jamesville	6.97
Onondaga	5080	Elbridge Village-Camillus, Part I.	3.01
Oswego	772	Fulton-Hannibal, Part I.	3.67
Oswego	825	Fulton-Oswego	4.51
Oswego	826	Pulaski-Orwell	5.94
Oswego	5082	Mexico-Union Square, Part II.	2.92
Oswego	5083	Union Square-Pulaski, Part I.	2.61

Sealed proposals will also be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at one o'clock P. M., on Friday, the 13th day of January, 1911, for the improvement of the following highways:

County.	Highway No.	Name of Road.	Approximate Miles.
Ontario	639	Cheshire-McJennetts Hill	7.04
Ontario	5081	Lima-East Bloomfield, Part II.	5.26
Otsego	833	West Exeter-West Winfield	5.44
St. Lawrence	875	Elmdale-Gouverneur	5.83
St. Lawrence	876	Brasies Corners-Elmdale	3.82
St. Lawrence	878	Ogdensburg-Morristown, Part 1	6.74
Saratoga	741	Saratoga-Corinth	4.06
Saratoga	815	Corinth-Hadley	6.22
Saratoga	5085	Ballston-Ballston Lake, Part II.	4.40
Schenectady	793	Schenectady-Vischers Ferry	2.34
Schenectady	880	Schenectady-Duanesburg, Part I	2.79
Schoharie	5086	Gallupville-Vrooman	5.00
Seneca	324	Center Road-Fayette, Part I.	3.19
Seneca	5087	Geneva-Waterloo	5.95
Warren	5088	Riverside-Wevertown, Part II.	1.53
Washington	802	Smiths Basin-Hartford	5.26
Wayne	5089	Clyde-Savannah, Part I	4.55
Cortland	881	Blodgetts Mills-Cortland	1.79
Cortland	882	Scott-Spafford	2.55
Cortland	5075	Cortland City-Clinton Ave.	0.53

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the offices of Division Engineer Spencer J. Stewart, Columbus Hall, Poughkeepsie, N. Y., for the road in Dutchess County; at the office of Division Engineer Harry P. Willis, Humane Building, Albany, N. Y., for roads in the counties of Albany, Clinton, Columbia, Greene, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, Warren and Washington; also at the office of Division Engineer Guy H. Miller, Cleveland Building, Watertown, N. Y., for roads in the counties of Franklin, Jefferson, Hamilton, Lewis, Oneida and St. Lawrence; also at the offices of Division Engineer Fred. W. Sarr, South Clinton and West Jefferson Streets, Syracuse, N. Y., for roads in the counties of Cayuga, Chenango, Cortland, Madison, Onondaga, Ontario, Oswego, Seneca and Wayne; also at the office of Division Engineer M. W. Wilbur, 423 Cutler Bldg., Rochester, N. Y., for roads in the counties of Cattaraugus, Chautauqua and Genesee; and also at the office of Division Engineer Paul McLoud, Press Building, Binghamton, for roads in the counties of Broome and Otsego.

The especial attention to bidders is called to "Information for Proposers" on pages 6 and 7 of the specifications.

Proposals for each road must be presented in a separate sealed envelope endorsed on the outside with the name and number of the road for which the proposal is made.

Each proposal must be accompanied by a New York draft or certified check payable to the order of the State Commission of Highways for an amount equal to at least five per cent. of the amount of the proposal which such draft or check accompanies. This draft or check will be held by the Commission until the contract and bond are duly executed.

The successful bidder will be required to give a bond for fifty per cent. of the amount of the contract; such bond to be executed by a Surety Company to be approved by the Commission, or a bond secured by the deposit of collateral securities to be approved by the Commission.

The right is reserved to reject any or all bids.

S. PERCY HOOKER,
Chairman.
T. WARREN ALLEN,
ROBERT HARI,
Commissioners.

Quantity, Quality and Cost of Output Determine the Value of a Mixer

In One Year More Than Half-a-Million Cubic Yards of Concrete have been mixed and placed in the Gatun Locks of the Panama Canal, all mixed by **Chicago Improved Cube Mixers.**

This type of mixer was adopted after two years' test, on actual preliminary work, of all the leading types of concrete mixers. The selection was determined on the basis of **quality plus efficiency.** There are a number of mixers that will mix concrete as fast as the Chicago Improved Cube, **but they will not produce concrete of equal quality** as fast as will the Chicago Improved Cube.

Cube mixing stands by itself. It must, because the scientific principle of perfect mixing—incorporation under pressure—is possessed by the cube alone. A substitute can be devised for almost any of the superior features of a Chicago Improved cube **except the mixing principle.** This is unique with the cube.

Send for Catalogue No. 2.

Municipal Engineering and Contracting Co.

Railway Exchange Chicago, Ill.

NEW YORK OFFICE, 30 CHURCH ST.

Agents wanted in unoccupied territory

Acme Center Dump Bucket Patented April 5, 1910

SIMPLE AND STRONG

The simplicity of construction and symmetrical movement of doors when opening and closing make them the strongest buckets on the market. Practical in every sense. For big or small work.

Do you want to join the list of satisfied users?

Write for catalog.

THE ACME EQUIPMENT and ENGINEERING CO.

1032 Garfield Bldg., Cleveland, Ohio.

SELLING AGENTS

The Barron & Cole Co., New York City
Standard Supply and Equipment Co., Philadelphia, Pa.
C. A. Cleaver, Houston, Tex.
The Chas. F. Beebe Co., Portland, Oregon.

USE

EUREKA MIXERS

For Quick Work For Good Work

For Making Money

In use everywhere by successful contractors. Ask for positive proof.

Also Mortar Mixers

EUREKA MACHINE CO.

25 CASE STREET - - - LANSING, MICH.

General Eastern Agents: 6021-22 Metropolitan Bldg., New York City

CONCRETE SIDEWALKS AND DRAIN PIPES.

Paducah, Ky.

Sealed proposals will be received by the Board of Public Works of the City of Paducah, Kentucky, until 3:30 P. M., January 16th, 1911, for the construction of concrete sidewalks, granite curbing, concrete gutters and driveways, and cast-iron drain pipes, on the following streets, work to commence in the Spring as soon as weather will permit:

BROADWAY, FROM I. C. R. R. TO 15TH STREET.

Approximate Quantities.

Concrete Sidewalks	14325.00	sq. ft.
Concrete Driveways	820.00	sq. ft.
Concrete Gutters	2900.00	lin. ft.
Granite Curbing	2900.00	lin. ft.

JEFFERSON STREET, FROM 11TH ST. TO 14TH ST.

Approximate Quantities.

Concrete Sidewalks	23000.00	sq. ft.
Concrete Driveways	800.00	sq. ft.
Concrete Gutters	3940.00	lin. ft.
Granite Curbing	3940.00	lin. ft.
Cast Iron Drain Pipe	200.00	lin. ft.

NORTH 10TH STREET, FROM TRIMBLE ST. TO BURNETT ST.

Approximate Quantities.

Concrete Sidewalks	13300.00	sq. ft.
Concrete Driveways	380.00	sq. ft.
Concrete Gutters	2520.00	lin. ft.
Granite Curbing	2500.00	lin. ft.
Cast Iron Drain Pipe	500.00	lin. ft.

The bids on each of the above contracts must be accompanied by a certified check on some Bank of Paducah, Kentucky, for $250.00, payable to G. W. Walters, City Treasurer, which will be returned to the unsuccessful bidders. The successful bidder will be required to execute bond to the sum of 40% of his bid for the faithful performance of his contract, to extend during the construction period, and after the work is completed and accepted, to execute a maintenance bond for 25% of the cost of the work for a period of five years.

The Board of Public Works reserves the right to reject any and all bids.

For plans and specifications, address

L. A. WASHINGTON,
City Engineer.

Dec. 14th, 1910.

ROADS.

Salem, N. J., December 20, 1910.

Sealed proposals will be received by the Road Committee of the Board of Chosen Freeholders of the County of Salem, on Wednesday, January 11, 1911, at 10.30 o'clock A. M., at the Court House, Salem, New Jersey, for grading and placing gravel and oyster shell surface on the Mannington, Pilesgrove and Woodstown road (5.05 miles) in the townships of Mannington and Pilesgrove and the Borough of Woodstown, Salem County, N. J.

Specifications may be obtained and plans and profiles examined at the office of Howard B. Keasbey, Mecum Building, Salem, N. J., and also at the office of the State Commissioner of Public Roads, State House, Trenton, N. J. A certified check in the sum of $1,000, made payable to the order of the Director of the Board of Chosen Freeholders, Salem County, N. J., must accompany each bid, as a guarantee that the bidder will enter into a contract should the work be awarded to him.

The right to reject any and all bids is reserved.

HARRY P. GRAY,
Director.

ELECTRIC STREET LIGHTING.

Sidney, Ohio.

Bids for a ten (10) year Electric Street Lighting Contract will be received by Director of Public Service, Edd. McVay, Sidney, Ohio, up to twelve o'clock noon, Central Standard Time, on the 2nd day of January, 1911.

This contract will cover about 110 street arc lights, and from 50 to 75 incandescent alley lights.

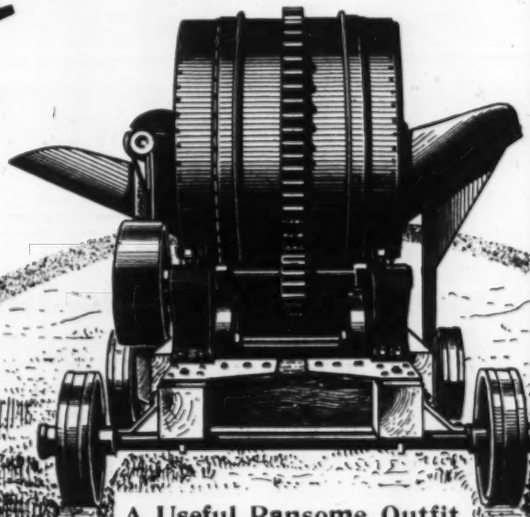
Sidney, Ohio, is the County Seat of Shelby County, with an estimated population of 8,500.

Parties interested in this contract will be informed in detail by communicating with

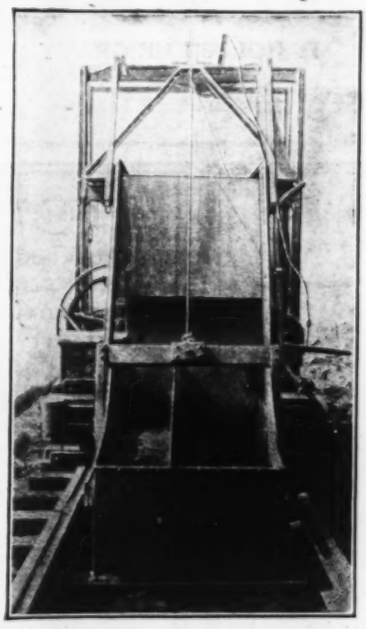
EDD. McVAY,
Director of Public Service,
Sidney, Ohio.

For other PROPOSAL ADVERTISEMENTS see pages 51, 52, 55, 56, 58 and Construction News, page 316.

On the Trail of the Ransome



A Useful Ransome Outfit
NEW YORK CITY



Get a RANSOME for speed and thorough mixing

Get the details by using the coupon today

Ransome Concrete Machinery Co.

DUNELLEN, N. J.

W. E. AUSTIN MACHINERY CO., Atlanta, Ga., Southern Sales Managers

SALES OFFICES:

1133 Broadway, New York.
Metropolis Bank Bldg., San Francisco, Cal.
Imperial Bank Chambers, Montreal, Can.
17th and Blake Sts., Denver, Colo.
Candler Bldg., Atlanta, Ga.
Monadnock Block, Chicago, Ill.
Avenida Juarez, Nos. 6 and 8 (P. O. Box 447), Mexico City, Mex.
6 Beacon St., Boston, Mass.
Chemical Building, St. Louis, Mo.
Victor Bldg., Kansas City, Mo.
1299 Fair Ave., Columbus, O.
Commonwealth Building, Philadelphia, Pa.
Keystone Bldg., 324 4th Ave., Pittsburgh, Pa.
121 W. 2d South St., Salt Lake City, Utah.
Bailey Bldg., Seattle, Wash.
Room 4, Grand Opera Bldg., Cincinnati, O.

"Ransome Concrete Machinery Co., Dunellen, N. J.
Send the "Ransome Mixer Book" and particulars
concerning the Great Ransome Guarantee to

.....

.....

.....

Milwaukee Mixers Lead

OUR PROPOSITION

We will put a **Milwaukee** on your work. Test it out in your own way. Abuse it. Don't oil it. Don't block it up. And after using it for five days accept it or turn it down. You be the judge as to whether or not the **Milwaukee** is superior to any Mixer that you have ever used. All that we ask is a chance to show you.

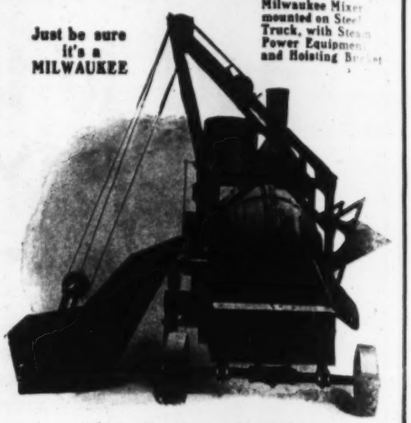
A SQUARE DEAL—WHY WE LEAD

Because our proposition is fair and square and our guarantee unequaled.
Because you do not have to block up the **Milwaukee** as is necessary with other Mixers.
Because they hold more than we claim and have excess power for operating.
Because they can be moved from place to place without dismantling or taking out one bolt.
Because it is only necessary to oil the tracker wheels once a month.
Because they are guaranteed five times longer than our nearest competitors.

There are other reasons too numerous to mention in our advertisements. Write for catalog. It will be worth your while.

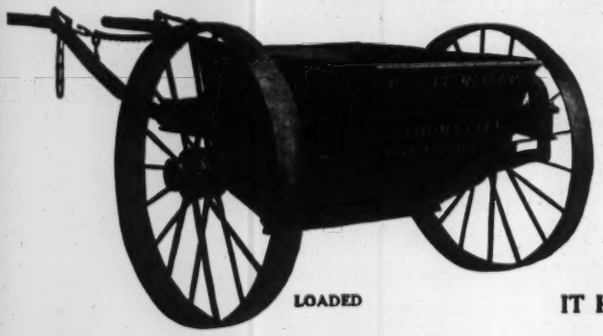
Milwaukee Concrete Mixer and Machinery Co.
Milwaukee, Wis., U. S. A.

REPRESENTATIVES WANTED IN OPEN TERRITORIES



Steam, Gasoline or Motor Power

The Goit Patent Concrete Spreading Dump Cart



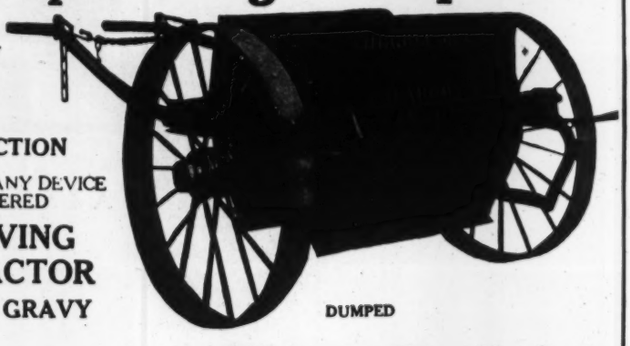
LOADED

SETS NEW MARK IN RAPID CONSTRUCTION

SUPERIOR TO ANY DEVICE EVER OFFERED

The PAVING CONTRACTOR

IT HOLDS THE GRAVY



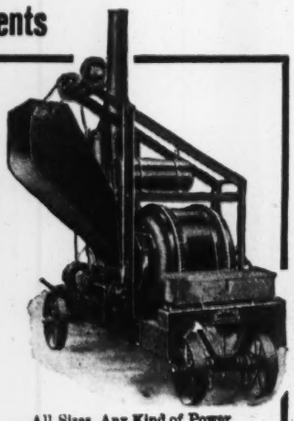
DUMPED

THE GOIT MANUFACTURING CO., Inc., - - - Oklahoma City, U. S. A.

It Meets All Requirements

The

KOEHRING



All Sizes, Any Kind of Power

A Thoroughly RELIABLE and DEPENDABLE

Concrete Mixer

Without complicated Mechanism and "Fussiness."

It Needs no "EXPERT" to Operate it

It produces concrete that's right and does it *economically.*

It hustles the work and *keeps things on the move.* No mixer can handle a batch with greater economy with the assurance of its being right.

Get in touch with us before you purchase. Catalogues R and S give details.

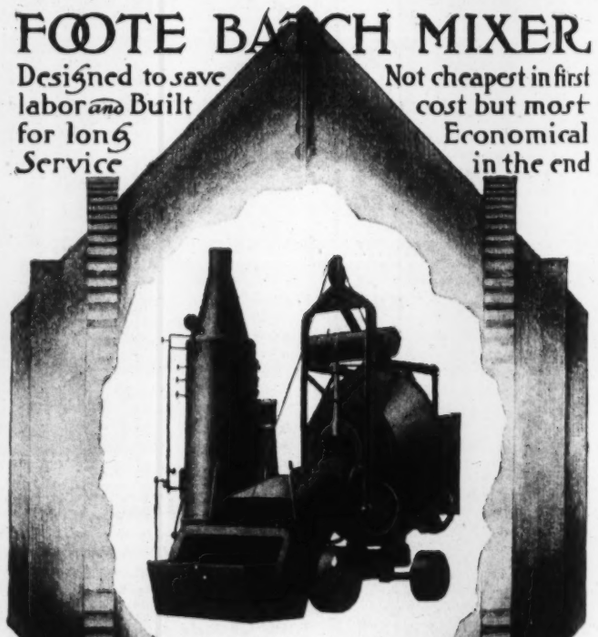
KOEHRING MACHINE CO., Milwaukee, U. S. A.

FRED. O. JOHNSON, 70 Kilby St., Boston, Mass., New England Agent
HORACE B. TREVOR, 521 Cutler Building, - - Rochester, N. Y.

FOOTE BATCH MIXER

Designed to save labor and Built for long Service

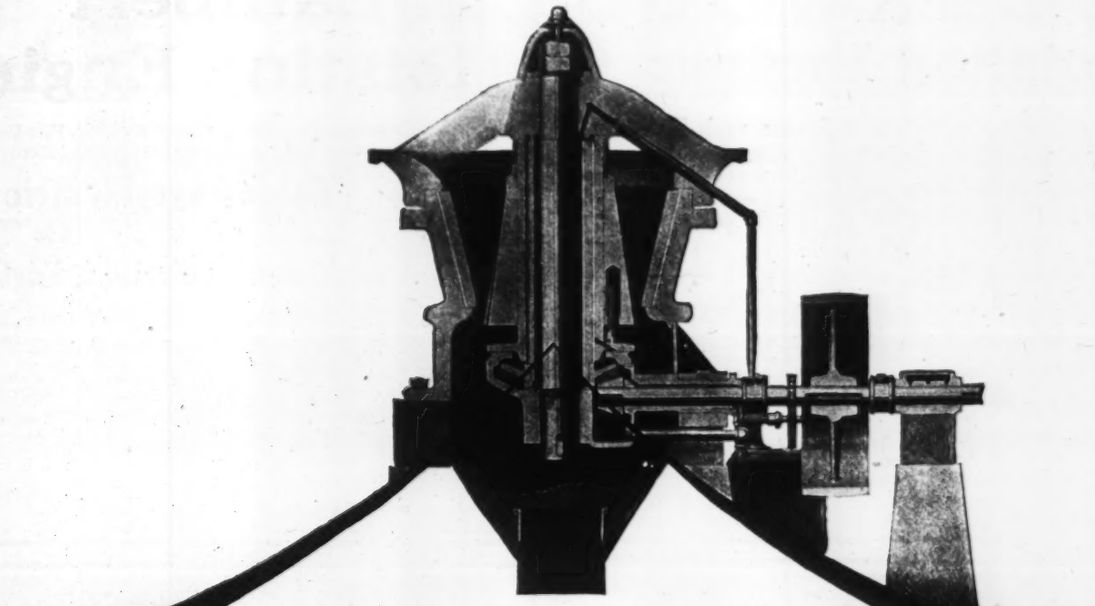
Not cheapest in first cost but most Economical in the end



ADDRESS THE NEAREST AGENT

Hallidie Co. Spokane
E. J. McHarg & Co. Binghamton, N.Y.
Hallidie Machy. Co. Seattle
The W. H. Wilcox Co. Binghamton, N.Y.
Foote Concrete Machy. Co. San Francisco
McKelvey Machinery Co. 6 Albany St., New York.

FOOTE CONCRETE MACHINERY CO., 182 La Salle St., CHICAGO



TAKE A SQUINT

Mr. Stone-Man, at that central shaft. It is not merely suspended. It is not just supported. It is a big bolt—a short, thick steel forging of enormous strength, tying the stocky, two-piece frame into a rigid unit, which even the hardest usage cannot break or budge. That big central bolt tells why the strongest crusher on the market is the

Symons Crusher

Look at that eccentric encasing the shaft, and at the headliner enclosing the eccentric. To break the shaft, you must also shear eccentric and headliner. Note the great length and large diameter of the eccentric. Imagine the great main bearings constantly drenched with oil, five gallons per minute if needed. Then, calculate the area of the feed openings and don't forget, in figuring capacity, that the head moves as far at the top as at the bottom.

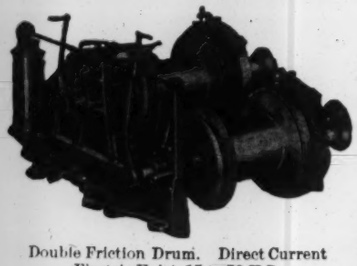
Write for Catalog No. 151

THE T. L. SMITH COMPANY

1302 Majestic Building
MILWAUKEE, WIS.

OLD COLONY BUILDING, CHICAGO

LIDGERWOOD
Hoisting Engines



Double Friction Drum. Direct Current Electric Hoist, 15 to 50 H.P.

Steam and Electric

Built to meet the requirements of contractors, railroads and general derrick work.

A *special feature* of our new style double friction drum electric hoist, 15 to 50 H.P., is a pinion between the two drums enabling both drums to revolve in the same direction. This is desirable when it is intended to add boom swinging gear at some future time.

More than 32,000 Engines and Electric Hoists in use.

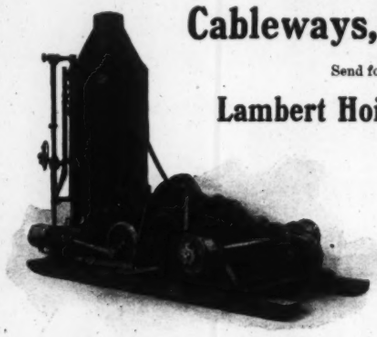
LIDGERWOOD MFG. CO., 96 Liberty St., New York

BOSTON PITTSBURG CLEVELAND
CHICAGO PHILADELPHIA SEATTLE LONDON, ENG.

The Lambert Hoisting Engines

For { Mining, Quarrying, Coal Handling, Pile Driving, Builders' Use, Logging and General Contracting

Cableways, Electric Hoists



Standard Double Drum with Swinging Gear.

Send for Catalogue EN

Lambert Hoisting Engine Co.

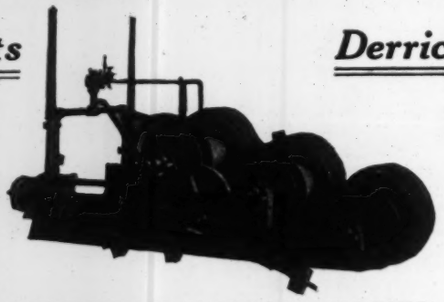
Main Office and Works
115-121 Poinier Street
Newark, N. J.

New York City, 30 Church St.
Atlanta, Ga., 4th Nat'l Bank Bldg.
Seattle, Wash., 24 West Connecticut St.
Cambridgeport (Boston), Mass., 117 Main St.
Allegheny, Pa., Sandusky and Lacock Sts.
Philadelphia, Pa., 1710-1712 Market St.
St. Louis, Mo., 715 North Second St.
Baltimore, Md., 229 S. Howard St.
Chicago, Ill., 1156 Monadnock Block
New Orleans, 217 South Peters St.

Thomas Carlin's Sons Co.

1918 Henry W. Oliver Bldg. Pittsburgh

Hoists ***Derricks***

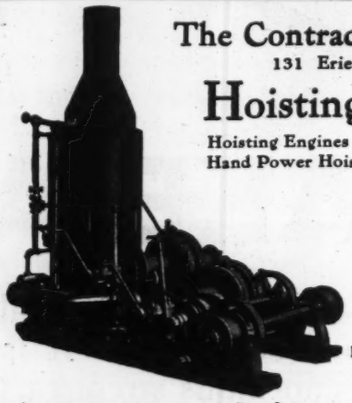


THREE DRUM CLAM SHELL DERRICK HOIST

The Contractors' Plant Mfg. Co.

131 Erie Street, Buffalo, N. Y.

Hoisting Machinery



Double Drum Hoisting Engine With Boom Swinger

Hoisting Engines
Hand Power Hoists
Electric Hoists
Horse Power Hoists
Derricks—Wood, Steel and Pipe
Derrick Castings and Forgings
(Derrick castings can be made of steel if so ordered)
Rooter Plows, Grooved Road Rollers

HAVE LARGE STOCK ON HAND
PROMPT SHIPMENT ASSURED

Eastern Office: 95 Liberty St., N. Y. City
JOHN T. HORTON, Sales Mgr.
W. E. AUSTIN CO., Atlanta, Ga.
Southern Representative

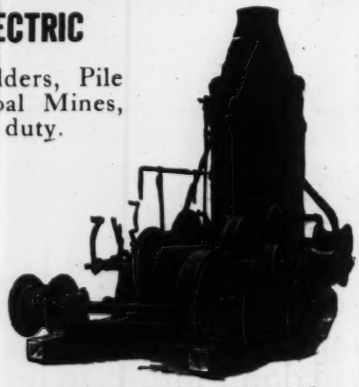
FLORY HOISTING ENGINES

STEAM AND ELECTRIC

For Contractors, Builders, Pile Driving, Logging, Coal Mines, Quarries and general duty.

Cableways
Dredge Machinery

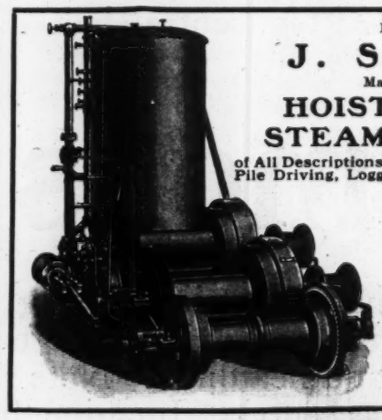
all made to duplicate material tested in our laboratory, and guarantee satisfaction.



PATENT BOOM SWINGER
Simple and Efficient

Write for Pocket Catalog

S. FLORY MFG. CO., Bangor, Pa.



ESTABLISHED 1870

J. S. MUNDY

Manufacturer of High Class

HOISTING ENGINES
STEAM BOILERS, Etc.,

of All Descriptions for Mud Dredging, Bridge Erecting, Pile Driving, Logging, Mining and Quarrying, Steam, Electric and Gasoline

HOME OFFICE
22 to 34 Prospect Street, NEWARK, N. J., U. S. A.

BRANCH OFFICES
39 Cortlandt St., New York.
1744 Market St., Philadelphia, Pa.
327 Water St., Pittsburg, Pa.
224 Water St., Norfolk, Va.
28 Light St., Baltimore, Md.
Market and Randolph Sts., Chicago, Ill.
140 Pearl St., Boston, Mass.
210 Washington St., St. Louis, Mo.
29 First St., Portland, Oregon.
203 W. Pearl St., Cincinnati, O.

68 New Patent Derrick Swinging Engine

HOISTING ENGINES

Built for All Kinds of Hoisting and Haulage Work

STROUDSBURG ENGINE WORKS

Main Office and Works, Stroudsburg, Pa.

AGENTS:
Standard Supply & Equipment Co., Philadelphia and Pittsburg, Pa.
Wm. B. Hough Co., Chicago, Ill.
C. A. Burton Machinery Co., Kansas City, Mo.
Fairbanks, Morse & Co., Portland, Ore.
Moran Engineering Co., Seattle, Wash.
Gibbens & Stream, New Orleans, La.
T. Murphy Iron Works, Jacksonville, Fla.
Fred O. Johnson, Boston, Mass.

CLYDE

HIGH GRADE HOISTING ENGINES

Have Steel Gears and Steel Ratchets

They have extra heavy shafting and long bearings.

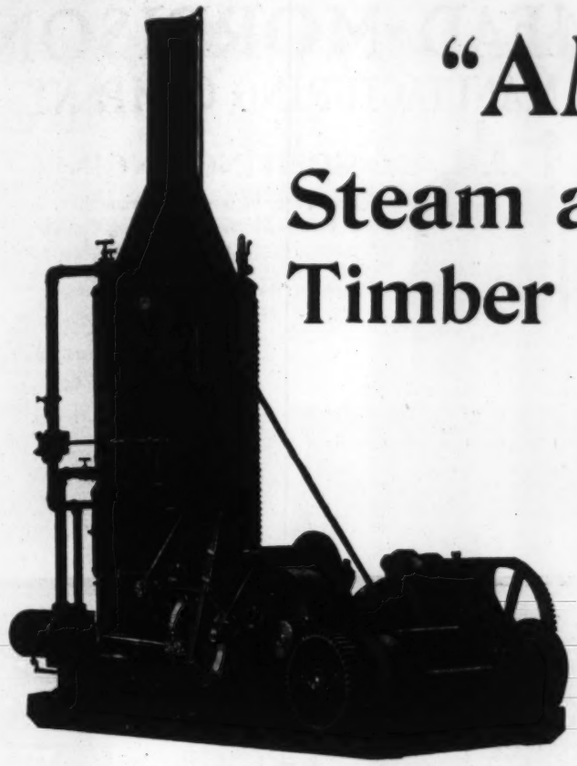
The frictions are positive. Connecting rods have solid ends.

Boilers have large heating surface and are securely fastened with two anchor rods on each side.

We carry large stocks of standard sizes for immediate shipment. Send for catalogue.

CLYDE IRON WORKS
Duluth, Minn.

Savannah, Ga. New Orleans, La.
Chicago, Ill., 318 Fisher Bldg.



"American" Derrick Engine

"AMERICAN"

Steam and Electric Hoists
Timber and Steel Derricks

of all capacities

Designed for every purpose

Built for the discriminating buyer

Ask for our catalog

American Hoist and Derrick Company

CHICAGO
NEW YORK
PITTSBURG
NEW ORLEANS

SAN FRANCISCO
LOS ANGELES
SEATTLE
PORTLAND

ST. PAUL, U. S. A.

SPOKANE
KANSAS CITY
DENVER
WINNIPEG

VANCOUVER
EDMONTON
CALGARY

The Dake Swinging Gear

FOR SWINGING DERRICK BOOMS
USED WITH EITHER

Compressed Air or Steam

Write for Prices

Dake Engine Co.

Grand Haven, Mich.

New York Agent
Mr. H. L. DRULLARD
50 Church St.

YOUR PROPOSAL NOTICES IN ENGINEERING NEWS
Reach the Largest Circulation in the Civil Engineering and Contracting Field

WE MANUFACTURE

PORTABLE HOISTING ENGINES

for all purposes, and sell them at the lowest possible price.
All Engines built on Steel Frame and with Steel Drum Barrels.

ALSO

GEARED LOCOMOTIVES, DERRICK CARS, DERRICK IRONS, HAND POWERS BLOCKS AND SHEAVES

We make a specialty of Double Platform Elevators for handling brick and mortar. These Elevators are adapted to any height building.

Write for Catalogue

The John F. Byers Machine Co.
RAVENNA, OHIO

Dobbie Foundry and Machine Co.

Engineers and Manufacturers

DERRICKS

All Capacities, Steel or Timber Construction, Stationary and Portable

LOCOMOTIVE CRANES, ELECTRIC HOISTS

Main Office and Works: Niagara Falls, N. Y.

BRANCHES

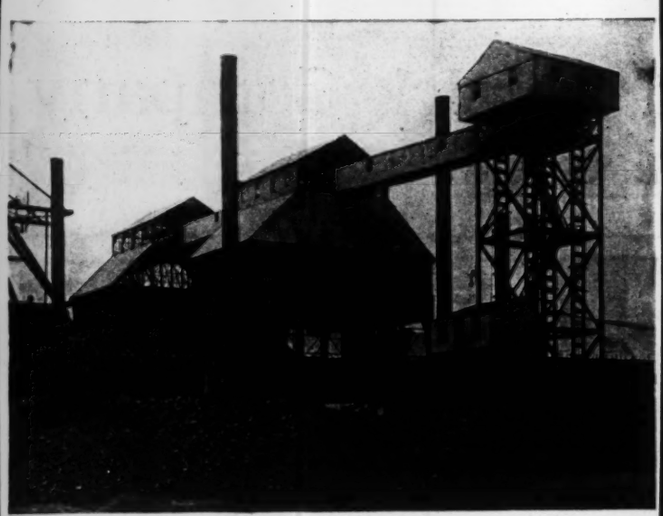
82 Warren Street
New York

712 Machesney Building
Pittsburgh

202 South Water Street
Chicago

COAL HANDLING EQUIPMENTS

ADAPTED TO ALL REQUIREMENTS



"Link-Belt" Coal-Handling System installed for the Maryland Steel Company, Sparrow's Point, Md. Delivers 1600 tons daily to two overhead bins for coke-oven supply

FOR PARTICULARS OF THE MOST APPROVED PRACTICE IN CONVEYING COAL AND OTHER MATERIAL, ADDRESS

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

NEW YORK, 299 Broadway
PITTSBURGH, 1501-2 Park Building
ST. LOUIS, Central National Bank Bldg.
SEATTLE, 439-440 New York Block
DENVER, Lindroth, Shubart & Co.
NEW ORLEANS, Wilmot Machy. Co.
SAN FRANCISCO, Eby Machinery Co.

MEAD-MORRISON MANUFACTURING COMPANY

HOISTING ENGINES

For every variety of service there is a Mead-Morrison Hoisting Engine.

For dock, railroad or bridge construction, for pile driving, quarrying or running trench machines, the Mead-Morrison "Standard" Hoisting Engine is unequalled.

Correspondence Invited

Works and Main Office:
CAMBRIDGE, MASS.

NEW YORK, 149 Broadway
CHICAGO, Monadnock Block
BALTIMORE, 93 Maryland Trust Bldg.
PITTSBURG, 1806 Machesney Bldg.
SAN FRANCISCO, Metropolis Bank Bldg.
NEW ORLEANS, 110 North Peters St.
MONTREAL, 286 St. James St.

LAMSON

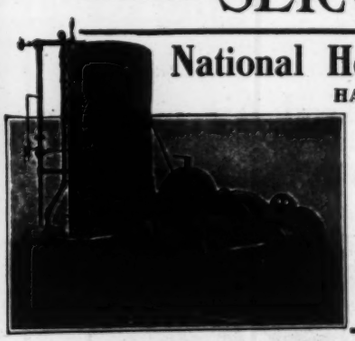
CASH CARRIERS PARCEL CARRIERS
PNEUMATIC TUBES
CABLE CARRIERS SELECTIVE CARRIERS
BELT CONVEYORS

Lamson service solves the entire problem of rapid, systematic and economical assembly or distribution of light matter within and between buildings.

ASK FOR BULLETIN Q

LAMSON CONSOLIDATED STORE SERVICE CO.
BOSTON, U. S. A.
Agencies in all principal cities

SERVICE



National Hoisting Engine Co.

HARRISON, N. J.

Steam and Electric
Hoisting Engines
Derricks, Cableways
Pile Drivers

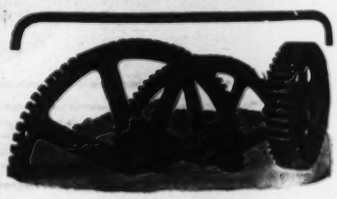
STAR BRAND BLOCKS

For all kinds of heavy hoisting such as coal and cargo.

Strong, serviceable, guaranteed to give long service.

Send for Catalog H

BOSTON and LOCKPORT BLOCK CO.
108 Condor St.
EAST BOSTON, MASS.



Good Gears

Hub, arms, rim and teeth symmetrical; rim true, teeth uniform in size and shape and accurately spaced. These are the qualities that give Caldwell gears great durability and high efficiency. Caldwell gears work smoothly and wear long.

Send for Catalog No. 34

H. W. Caldwell & Son Co.
Chicago, 17th St. and Western Ave.
New York, Fulton Bldg., Hudson Terminal
50 Church Street
Boston, 141 Milk Street

ROBINS BELT CONVEYOR

THE Robins Belt Conveyor was the original and is today the standard of this type of conveying machinery.

It is successfully and economically conveying ore, rock, coal and similar materials under the most trying conditions of service.

Correspondence Invited.

ROBINS CONVEYING BELT COMPANY

THOMAS ROBINS, President — C. KEMBLE BALDWIN, Chief Engineer

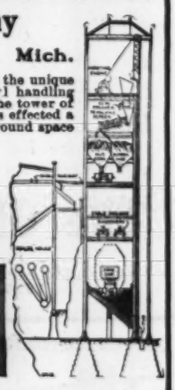
General Office: 13 Park Row NEW YORK

Chicago, Old Colony Building. San Francisco, 733 Monadnock Building. Los Angeles, Pacific Electric Building. New Orleans, 108-112 North Peters Street.

Detroit Edison Electric Company

Delray, Mich.

The Diagram shows the unique arrangement of the coal handling machinery, located in the tower of the building, which has effected a great saving of time, ground space and labor.



Our specialty is the economical handling of coal and ashes in power stations, and our engineers are ready to study your particular case and apply the cheapest and most modern methods. They are at the service of any present or prospective customer. Call on them to solve your problem.

C. W. Hunt Company, Main Office and Works WEST NEW BRIGHTON, N. Y. [City Limits]

New York City, 45 Broadway. Richmond, Va., State Bank Building. Atlanta, Ga., 607 Rhodes Building. Chicago, 1616 Fisher Building. San Francisco, 865 Monadnock Building.

HAZARD

SPECIAL PLOUGH STEEL

WIRE ROPE

"OLYMPIC BRAND"

Is especially adapted to withstand sharp bending stresses, where drums and sheaves are smaller than standard diameter. Its strength, toughness and wearing quality are unexcelled.

Ask for our catalogue on the subject.

HAZARD MFG. CO., Wilkes-Barre, Pa.

NEW YORK 50 Bay St. — PITTSBURGH 21 Canonsburg Bldg. — CHICAGO 552-554 Adams St.

The Science of Leverage

The gear system in the Triplex Block is so simple, strong and efficient that with it one man alone can lift twenty tons. Write for the Book of Hoists.

THE YALE & TOWNE MFG. CO.

Makers of Yale Products

9 Murray Street — New York

PLAIN LETTERING

By PROF. HENRY S. JACOBY

Most comprehensive book on this subject. Contains standards of U. S. Engineer Corps, U. S. Geological and Geodetic Surveys, and Mississippi River Commission.

Cloth, 10 x 7 inches; 82 pages. Price $3.00.

A. S. BERQUIST, BROOKLYN, N.Y., U.S.A.

BERQUIST'S "SUSPENSION BUNKER." PATNAY 30, 1899 NO 625,947.

The best bin for the least money

Write me for an estimate.

A. SAM'L BERQUIST

1571 47th Street — Brooklyn, N. Y.

Every Jeffrey Conveyer

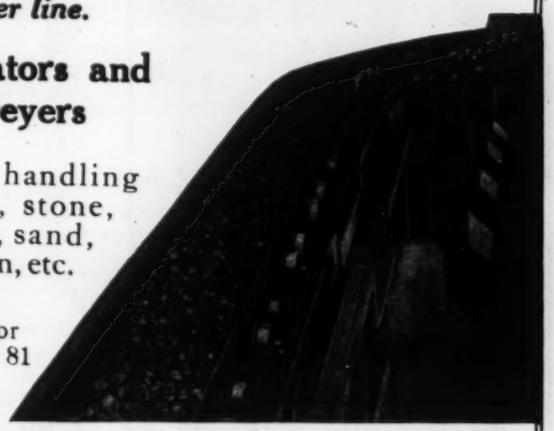
is built for the particular work it is intended to do.

Illustration here shows Jeffrey Steel Drop Pan Conveyer, capacity 80 cubic yards per hour, traveling 70 feet per minute, discharging automatically into bins along the conveyer line.

Elevators and Conveyers

For handling coal, stone, ore, sand, grain, etc.

Send for Catalog 81



The Jeffrey Mfg. Company

Columbus, Ohio

Chicago, St. Louis, Denver — Montreal, Pittsburg, Charleston, W. Va. — Boston, New York, Birmingham

HANDLING AND STORING BITUMINOUS COAL

Our patented system of circular pile with revolving locomotive-crane is the **lowest first-cost** system on the market, and combines with this, **low handling and maintenence cost.**

View shows one of two 40,000 ton plants designed and built for the Atlantic Coast Line Railway. The crane runs on a circular track around a central pit which receives coal from incoming cars. The self-filling clam shell bucket takes the coal from pit and delivers to storage or to the locomotive coaling pocket. Coal can be taken direct from storage pile to pocket by same means.

The subject of coal-handling is explained in our book, "Handling and Storing Coal and Ore." A copy will be mailed to any address on request

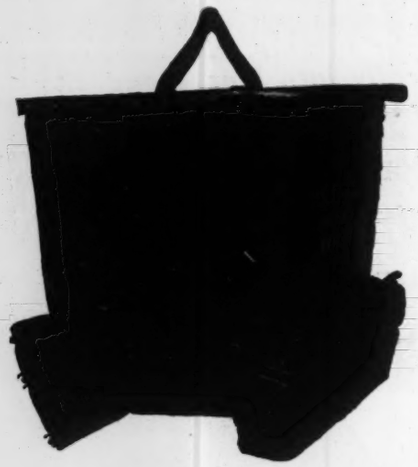
THE J. M. DODGE COMPANY

NICETOWN, PHILADELPHIA

NEW YORK, 299 Broadway — PITTSBURGH, 1501-2 Park Bldg.
CHICAGO, 39th St. & Stewart Ave. — SEATTLE, 439-440 N. Y. Block

INSLEY

Center Dump Pier Buckets



The general service bucket for excavation and foundation work. In use by the largest contractors in the country.

Insley Mfg. Co., INDIANAPOLIS

LAKEWOOD LINE

We have in stock for immediate shipment 14, 18, 21, 27, 36, 42 cu. ft. Lakewood Straight Side Contractors' Buckets, and 12, 27, 30, 42 cu. ft. Lakewood Flaring Side Contractors' Buckets, all with double bottoms. These must be moved before winter, and we offer very attractive prices. The buckets are very substantially built to the best standard dimensions and specifications, tested for dumping and righting qualities, and for sale at bargain prices.

Write for most complete catalog of concrete handling equipment ever issued—now in press.

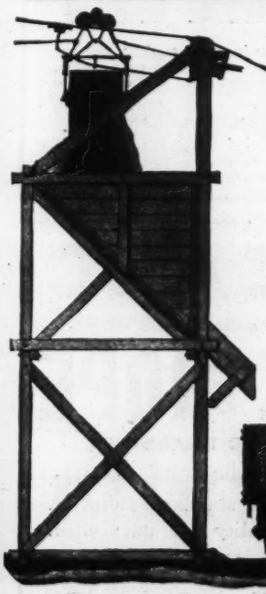
The Ohio Ceramic Eng. Co.
CLEVELAND, OHIO
1015 First National Bank Building, Chicago

The name to remember when you buy

Wire Rope

ROEBLING

Shipments direct from the Roebling works at Trenton, N. J., and from Agencies and Branches throughout the Country



TWO-BUCKET OR GIG-BACK SYSTEM OF AERIAL TRAMWAYS

Needs But One Attendant

who is located at the loading station and controls the Ore Gates, regulating the flow of material into the buckets, as well as the brake or power levers.

At the discharge station, no attendant is required.

The two-bucket system is the ideal type to use where the distance and capacity are suitable—usually on lines not exceeding 3,000 feet with a ten-ton to twenty-ton capacity per hour.

Write for detailed information. Ask for Catalogue 65.

BRODERICK & BASCOM ROPE COMPANY
ST. LOUIS NEW YORK SEATTLE

ESTABLISHED 1857
A. LESCHEN & SONS ROPE CO
920-932 NORTH FIRST STREET, ST. LOUIS, MO.
BRANCH OFFICES:
NEW YORK CHICAGO
DENVER SEATTLE

WESTERN ADVERTISERS

may have their **WANT** and **FOR SALE** Advertisements
ADDRESSED TO OUR CHICAGO OFFICE
1636 MONADNOCK BLOCK
and in that way save considerable time in forwarding.
Want Ads received in our Chicago Office by noon of the Monday preceding publication will be inserted in good location

The Faivrette Clam Shell Bucket

Built of Steel in all Sizes The Best Digger on Earth
See our large Ad every month THE G. H. WILLIAMS CO., Cleveland, O.

Hayward Standard Orange Peel Bucket

Owing to the shape of the blade arms and the manner in which they are connected to the lower center casting, they allow a greater amount of clearance in the bowl of the bucket when it is closing and closed. Complete specifications, prices and photographs upon request.

Hayward Buckets

The Proof

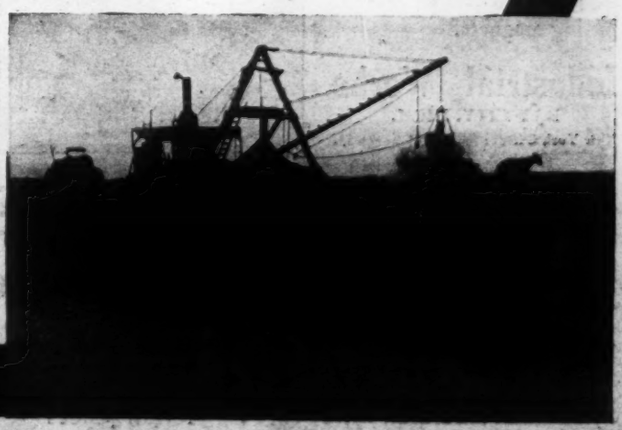
of Hayward Bucket efficiency will be found in their perfected construction. To Contractors and Engineers this stands for economy of operation.

There is no digging or rehandling proposition ever met by Contractors or Engineers for which we cannot guarantee some standard or special size and style of **Hayward Bucket** that will do the work economically.

Send for new Catalog No. 38—a book of actual digging operations, invaluable to every Engineer and Contractor.

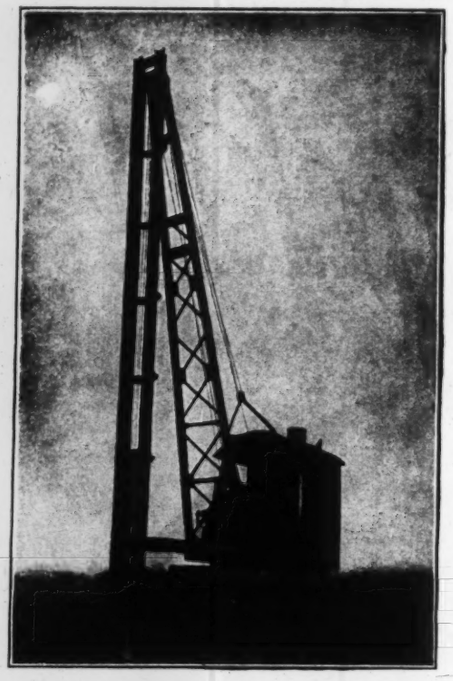
The Hayward Company

50 Church Street
New York



This illustration shows a Hayward Orange Peel Bucket, operated by a Skid Excavator, used by the United States Reclamation Service, in handling material for building the Hermiston Dam.

"McMYLER INTERSTATE" LOCOMOTIVE CRANES

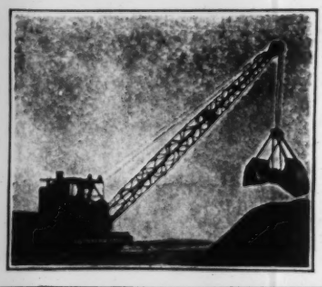


A "McMyler Interstate" Locomotive Crane with its various attachments is the best asset of a Contractor's Equipment

BUCKET ATTACHMENT
PILE DRIVER ATTACHMENT
CONCRETE TUB ATTACHMENT

The
McMYLER INTERSTATE COMPANY
CLEVELAND, OHIO
Works at Bedford (Cleveland Suburb) and Warren, Ohio

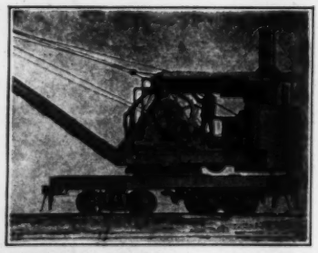
Coal Handling Ore Handling Structural Steel



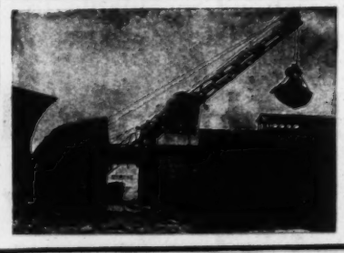
The Exeter Machine Works
PITTSTON, PA.
LOCOMOTIVE CRANES
WITH GRAB BUCKETS
STEAM AND ELECTRIC HOISTS
BRIDGE CONVEYORS
COAL, ASH, SAND AND ROCK HANDLING MACHINERY

LOCOMOTIVE CRANES

For general service, and equipped with grab buckets or lifting magnets.



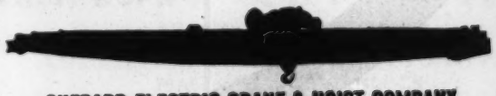
Industrial Works
BAY CITY, MICH.
New York Office: 50 Church St.
GEO. M. NEWHALL ENGINEERING CO., Philadelphia
J. G. MILLER, St. Louis, Mo. F. H. HOPKINS & CO., Montreal, Que.



BROWNING CRANE AND AUTOMATIC BUCKET
The equipment as illustrated is found a very useful, time and labor saving tool in and about industrial plants.
Its various attachments give it a wide range of duty.
Let us tell you more.
THE BROWNING ENGINEERING CO.
CLEVELAND, OHIO

Locomotive Cranes
of all types
for all places
Orton & Steinbrenner
Chicago, Ill.

SHEPARD CRANES UP TO EIGHTY TONS CAPACITY



Shepard Hoists for any service. We have 400 combinations. Tell us your needs. We can meet them with a standard machine.
Write for Hoist Handbook.

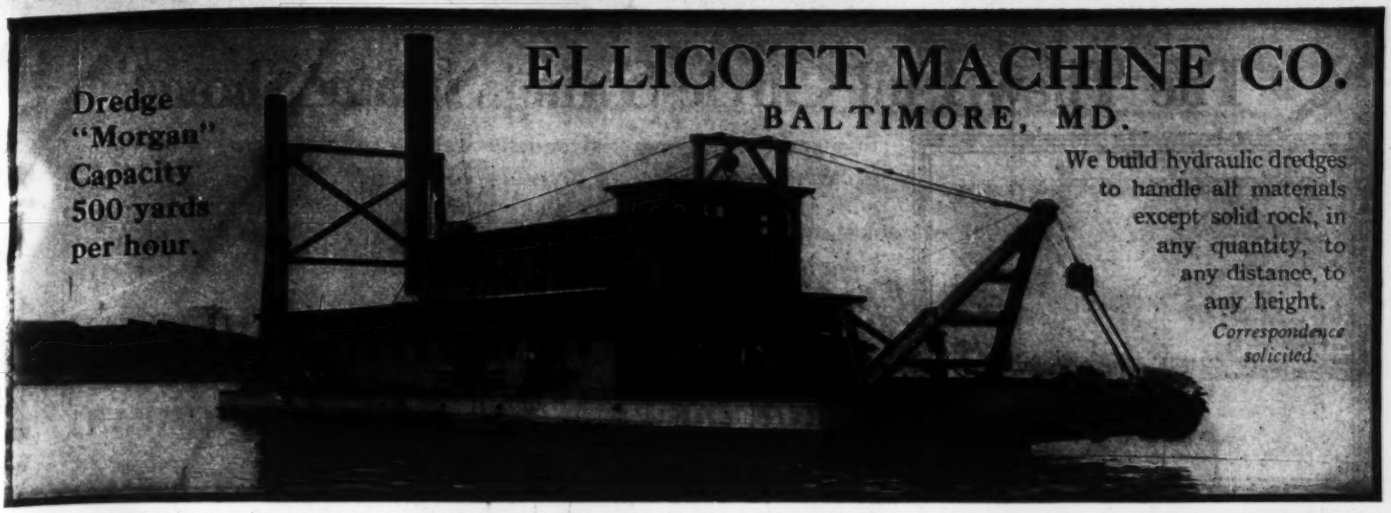
SHEPARD ELECTRIC CRANE & HOIST COMPANY
General Offices and Works, Montour Falls, N. Y.
New York Philadelphia Pittsburg Chicago Toronto Montreal

Buyers of "P&H" CRANES
Crane Catalog No. 7 are insured against the "troubles" which usually go with the cheap crane *Hoist Bulletin No. 18*
PAWLING & HARNISCHFEGER CO. MILWAUKEE WISCONSIN

ELLICOTT MACHINE CO.

BALTIMORE, MD.

Dredge "Morgan" Capacity 500 yards per hour.



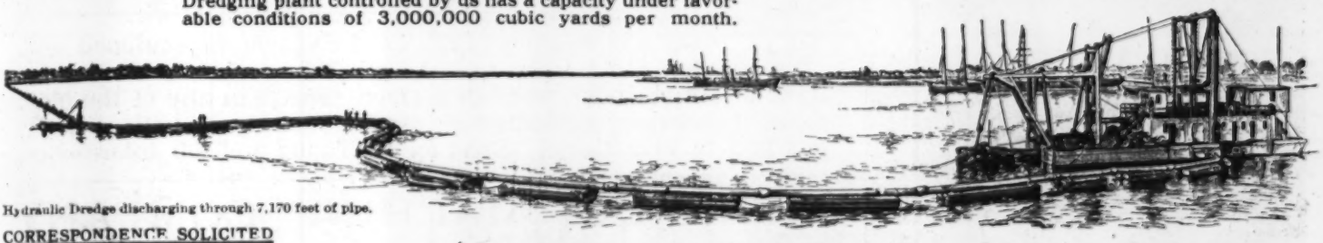
We build hydraulic dredges to handle all materials except solid rock, in any quantity, to any distance, to any height.

Correspondence solicited.

ATLANTIC, GULF AND PACIFIC CO.,

ENGINEERS AND CONTRACTORS

Dredging plant controlled by us has a capacity under favorable conditions of 3,000,000 cubic yards per month.



Hydraulic Dredge discharging through 7,170 feet of pipe.

CORRESPONDENCE SOLICITED

MAIN OFFICE
Park Row Building
NEW YORK

Specialties { Dredging, Dredging Machines
Land Reclamation, Docks
Piers, Foundations, Bridges

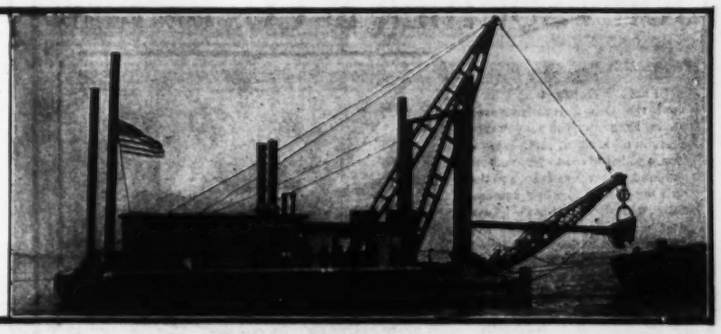
BRANCH OFFICES
865 Monadnock Bldg., San Francisco
Central Building, Seattle, Wash.
Manila, Philippine Islands

Osgood Dredge Co.

51 State St., Albany, N. Y.

MANUFACTURERS OF

Dipper and Clamshell Dredges



THEO. SMITH & SONS CO.

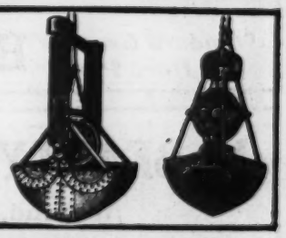
Telephone Call 44 JERSEY CITY, N. J. Established 1865 Incorporated 1899

Manufacturers of

Clam Shell Dredges and Buckets

ALSO DIPPER AND ORANGE PEEL BUCKETS

BLACKSMITHS, MACHINISTS and BOILERMAKERS



CATALOGS covering our advertisers' manufactures are on file and may be consulted at the New York Office of Engineering News

THE NORBOM ENGINEERING COMPANY

312 Denckla Building
PHILADELPHIA, PA.

Pontoon and Shore Pipes

Hydraulic Dredging Machinery

Repairs and Improvements

PUGET SOUND BRIDGE & DREDGING CO., Inc.

ENGINEERS
CONTRACTORS

CENTRAL BUILDING, SEATTLE, WASHINGTON

Bridges, Structural Work, Piers and Foundations, Harbor Improvements, Dredging and Land Reclamation

New York Offices:
ROOM 2407
PARK ROW BUILDING

The Thew Full Circle Swing Steam Shovel

digs and delivers material equally well in any direction. For cellar excavations, foundations or other constrained places, it can be used with great efficiency and economy. It can be used for limited outputs with little expense, being operated by one man. It swings through a complete circle, and the horizontal dipper crowding motion enables the dipper to fill in cuts as shallow as 18 inches.

Every one of several hundred in service giving excellent satisfaction

Send for Catalog No. 6

THE THEW AUTOMATIC SHOVEL COMPANY

Lorain, Ohio

Monighan Drag Line Excavators

WE make a specialty of Drag Line Excavators equipped with the latest improved machinery. These machines will do at least one-third more work in a given time than any of the older types, thus largely reducing the cost per yard of excavation. It will pay you to investigate. Send for catalogue and full information.

MONIGHAN MACHINE COMPANY

2016-30 CARROLL AVENUE CHICAGO

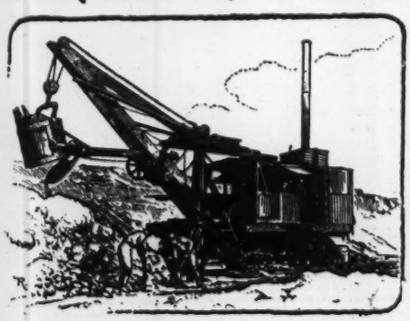
PLEASE FAVOR US WHEN WRITING ADVERTISERS BY MENTIONING ENGINEERING NEWS

JOHN SOUTHER & CO., 185 SUMMER STREET BOSTON, MASS., U.S.A.

To Whom it May Concern:

"I hereby certify that I have used the Otis Patent Improved Steam Excavator the past twenty years in all kinds of earth excavation, and believe it to be the best dry-land excavator in use, and the only one that will work successfully in hardpan material. I have excavated and put into cars five million yards under one contract for making land in Boston; with two of these machines I loaded from seventy to eighty thousand yards per month."

N. C. MUNSON



Standard Gravel and Hard Pan

EXCAVATORS

TISCO MANGANESE STEEL

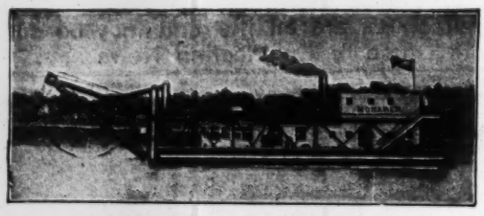
On account of its peculiar hardness and toughness is unsurpassed for roll shells, chutes, jaw plates and the heads of gyratory crushers.

Does your banker use a TISCO MANGANESE STEEL safe? POSTAL BRINGS BULLETIN

Taylor Iron and Steel Co., HIGH BRIDGE NEW JERSEY

M. BEATTY & SONS, Limited

Welland, Ontario, Canada



Dredges, Ditchers Derricks, Steam Shovels

Steel Dump and Deck Scows, Submarine Rock Drilling Machinery, Mine Hoists, Hoisting Engines, Centrifugal Pumps, Steel Skips, Coal and Concrete Tubs and other Contractors' Machinery.

Sole Canadian Makers WILLIAMS' "FAIVRETTE" CLAMS

We do not manufacture for Export

WHEN WRITING ADVERTISERS

Every advertiser is rather interested to know how you got his name, and we would request that when you write, you state that you secured it from the advertisement in

ENGINEERING NEWS

STIFF LEG HEAD BLOCK

of Latest Pattern

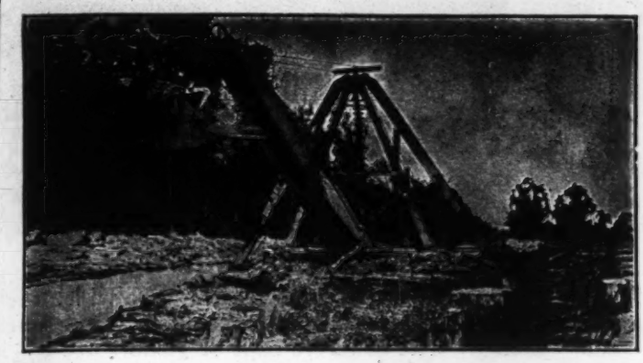
Note how simply it is attached to mast

Patented by

THE TERRY & TENCH COMPANY, Inc.

2179 Lexington Avenue, New York

POOLE ENGINEERING & MACHINE CO
ENGINEERS FOUNDERS AND MACHINISTS
BALTIMORE, MD.
MANUFACTURERS AND DESIGNERS OF ALL KINDS OF
HEAVY MACHINERY
REQUIRING FIRST CLASS WORKMANSHIP AND MATERIALS
MACHINE MOLDED AND PLANED GEARING
POOLE & LEFFEL TURBINE WATER WHEELS



Marion Telescopic Bank Spuds

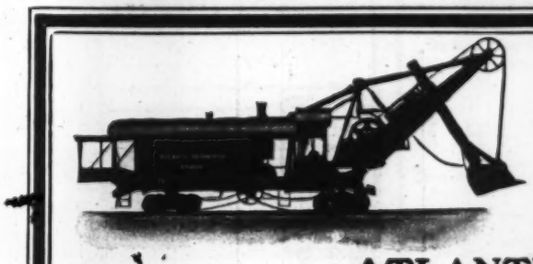
THE Bank Spuds now in general use were originated by us over a quarter of a century ago. Our *new telescopic* bank spuds offer a much greater working range than any other type, owing to the bracing from top of A-frame to bank. Strain on the boat is greatly relieved by doing away with a complicated spud frame. These spuds are equipped with independent hoist or pinning-up device, holding them rigid in any desired position. Marion machines have proven themselves of a superior type.

Dredges for all requirements. **Scraper Bucket Excavators.** **Steam Shovels.**

THE MARION STEAM SHOVEL CO., - Department E, - MARION, O.

New York: 50 Church Street
Chicago: 1442-3 Monadnock Block
San Francisco: 718 Monadnock Building
Montreal: F. H. Hopkins & Company

ASK FOR CATALOGS



THE NEW ATLANTIC

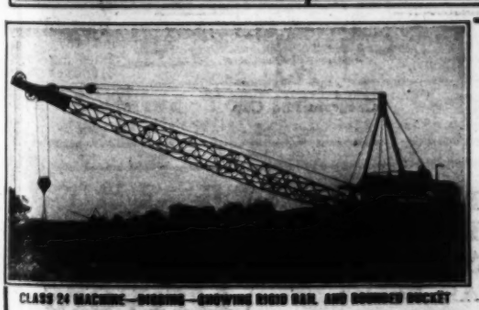
SIMPLE—STURDY

For heavy or light digging
No chain troubles
Few repairs
Not top heavy
Saves fuel

ATLANTIC EQUIPMENT COMPANY
30 Church Street, New York

Railway Exchange, Chicago
N. B. Livermore & Co., Salt Lake City, San Francisco, Seattle

2101 Beaver Avenue, Pittsburgh, Pa.
Montreal Locomotive Works, Ltd., Bank of Ottawa Bldg., Montreal, Canada



CLASS 24 MACHINE—DIGGING—SHOWING RIGID BAR, AND ROUNDED BUCKET

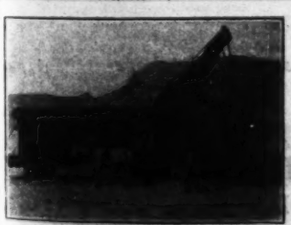
DRAG-LINE EXCAVATORS

IMPROVED DUMPING DEVICE
PATENTED BUCKET

Steam Shovels — Loco-Pile Drivers
Dredges — Wrecking Cranes
Unloading Plows

P. O. Box J **THE BUCYRUS CO.**
SO. MILWAUKEE, WIS.

CLASS 24 MACHINE—UNLOADING—SHOWING 3 PART HOIST AND DUMPING DEVICE



Little Giant Electric Shovel Loading Blasted Rock at Kokomo, Ind.

VULCAN ELECTRIC SHOVELS

IN ALL STANDARD SIZES
15 to 120 Tons, ⅛ to 5 Cubic Yard Dippers

REVOLVING SHOVELS
THREE SIZES: 15 to 40 Tons, ⅜ to 1½ Cubic Yard Dippers

EFFICIENT — DURABLE — ECONOMICAL

50 Church Street NEW YORK
350 Pierce Building ST. LOUIS

The Vulcan Steam Shovel Company
TOLEDO, OHIO
1106 Metropolis Bank Bldg., SAN FRANCISCO

304-305 Appel Bldg. DENVER, COL.
327-328 Hutton Bldg. SPOKANE

Little Giant Electric Shovel Loading Iron Ore in Spain

SECTION OF THE NEW 2900 FT. CONCRETE PILE BOARDWALK BUILT BY US AT ATLANTIC CITY, N. J.

THE walk is 41 ft. wide for a distance of 600 ft. and then narrows down to 21 ft. The wider section is supported on four pile bents, 20 ft. on centers, the piles being 10 ft. on centers. The narrow section is supported on two pile bents with the same spacing. The concrete caps or girders are 8½ x 24 ins. in section, with a 5-ft. cantilever at each end. The concrete piles are 16 ins. in diameter and of two lengths, 28 ft. and 32 ft. The shorter piles were placed in the more protected portions of the walk and the longer ones in sections where the chances of erosion were greater.

CO-OPERATIVE SERVICE

Our engineering department will make investigations, without charge, for engineers and architects representing owners of waterfront properties that are now occupied by timber docks, piers, wharves and bulkheads, and submit designs for, and cost estimates of, permanent concrete construction.

FREE PUBLICATIONS

Our catalog, which describes our methods and some of the more notable results of their application, and a brochure, "Baltimore's Municipal Dock Improvements," which embraces a description of some of our concrete dock work at Baltimore, may be obtained free at any of our offices.

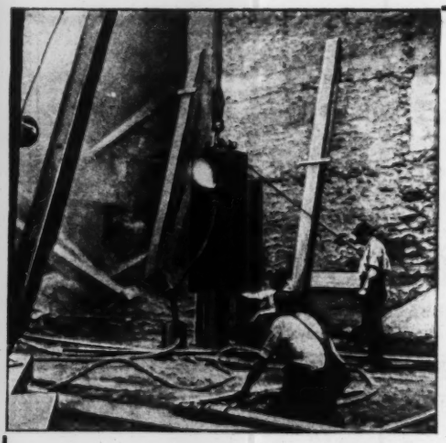
Raymond Concrete Pile Company

ENGINEERS and CONTRACTORS

Concrete piles and sheet piles, difficult foundations, permanent docks, piers, wharves, bulkheads, jetties, sea-walls and waterfront structures in general, bridges, viaducts, retaining walls and other types of reinforced concrete construction.

NEW YORK and CHICAGO

BALTIMORE PHILADELPHIA PITTSBURG ST. LOUIS PORTLAND, OREGON, WORCESTER BUILDING



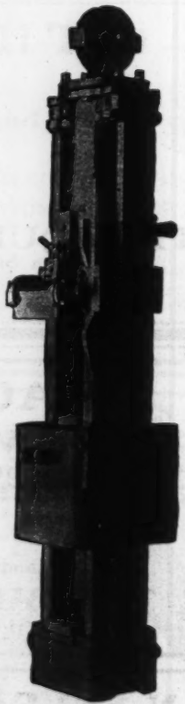
Driving Round Pipe In Foundation Work

The illustration shows

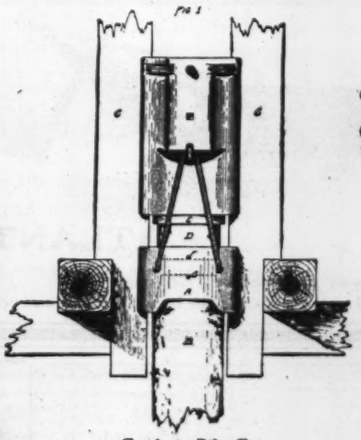
A No. 2 Arnott Hammer

driving round pipes for foundations for the Underpinning & Foundation Company, at their work, 140 West 27th Street, New York City.

Union Iron Works, West Shore Station HOBOKEN, N. J.



Warrington Steam Pile Driving Hammer



Casgrain Pile Cap

Sheeting Hammer 700 lbs. $200 without Hose.

Hand Power
Horse Power
Steam Power
Air Power
Gasoline Power

Pile Drivers

Please send for Catalogue

Vulcan Iron Works

Station D

Chicago, Illinois

Eppinger and Russell Co.

CREOSOTING WORKS

OFFICE: 165 Broadway, New York
WORKS { Jacksonville, Fla. / Long Island City, N. Y.

Creosoted Piles
Timber and Ties

Dealers in
YELLOW PINE TIMBER *and* TIES

INTERNATIONAL CREOSOTING & CONSTRUCTION CO.

WORKS-BEAUMONT, TEX. TEXARKANA, TEX.
Capacity 75,000,000 FEET B.M. Per Annum

ADDRESS ALL COMMUNICATIONS TO-
OFFICE GALVESTON, TEXAS
SEND FOR PAMPHLET

WOOD PRESERVING

PILE SHOES

JANNEY STEINMETZ & CO. Philadelphia

Card it
Write us
for Prices

Please Mention ENGINEERING NEWS

New Orleans Wood Preserving Works
Docks and Works, New Orleans, La.
The latest designed plant for the manufacture and treatment of wood with Creosote. Under one personal engineering management during twenty years. Is especially constructed for the perfect treatment of wood to prevent decay. Through our patents furnishing work of greater efficiency than can be obtained from other plants through the old processes. Cable Address, W. U. Code—Nowood, New Orleans, La.

A. SCHRADER'S SON, Inc.
32 Rose Street, New York
Established 1844
MANUFACTURERS OF
DIVING APPARATUS
Complete Stock of Dresses, Hose and Repair Sundries.
Improved Bolt Helmet.
All orders filled day received.
Write for Our Prices.

A. J. MORSE & SON, Inc.
221 High St., Boston, Mass.
Established 1837
DIVING APPARATUS
LATEST DESIGNS
Orders filled day received.
Special apparatus built to order

Cost of Timber Treating Cut in Half——

INDIAN
TIMBERASPHALT

The best wood preservative, costs 1-2 as much as Creosote, 1-10 as much as other Coal Tar Products, and is more effective.

This oil closes up the wood pores absolutely, excluding moisture, heat and air, making it impossible for destructive fungi to enter into or exist in the wood.

"TIMBERASPHALT" is slower running than Creosote or other Coal Tar Products, and therefore will not "bleed" or evaporate from the wood pores.

The presence of "TIMBERASPHALT" equalizes the chemical and mechanical life of any timber under all conditions.

Get detailed information and prices to-day.—Write to

The Wood Preserving Department
INDIAN REFINING COMPANY (Inc.)
General Offices
321 First Nat. Bank Bldg.
Cincinnati, Ohio

INDIAN
TIMBERASPHALT

Preserves	Preserves
Flooring	Railroad Ties
Piling	Telephone Poles
Paving Blocks	Fence Posts
Cross Arms	Mine Timber and
Bridge Timber	Structural Timber of
Shingles	every description

WEST PASCAGOULA CREOSOTING WORKS
West Pascagoula, Miss., U. S. A.
Situated on Pascagoula Bay and on the line of the Louisville & Nashville Ry. Est. 1875. Orders for creosoted piles, telegraph poles, crossarms, electric conduits, paving blocks, sawed ties and timber promptly executed. Cylinders 130 ft. long. Capacity, one million feet per month. A. B. C. code used. Cable address, Pierre, West Pascagoula, Miss. Address, JNO. B. LINDSEY, Supt.

Steel Driving Caps
reduce danger of suits for damages

Will not break and fall into the trench

Made for 2-inch and 3-inch plank. Net price per pound, $0.15

Inside Dimensions 6 x 2¼ inches	Weight 15 pounds	Code Word Mab
Inside Dimensions 7 x 2¼ inches	Weight 18 pounds	Code Word Mace
Inside Dimensions 8 x 3¼ inches	Weight 30 pounds	Code Word Mad

HAROLD L. BOND COMPANY
Manufacturers of Superior Grade of Contractors' Tools
383-391 Atlantic Avenue BOSTON, MASS.

Avenarius CARBOLINEUM
THE SIGN OF QUALITY
Maintained Since 1875
For BRUSH and TANK TREATMENT of STRUCTURAL TIMBER
CARBOLINEUM WOOD PRESERVING CO., 181 Franklin St., New York; 312 Prairie St., Milwaukee, Wis.; 181 Front St., Portland, Ore.

WOOD PRESERVING
Dead Oil of Coal Tar Process. Piling, Timbers and Ties CREOSOTED according to specifications. Rail or water delivery.
Creosoted Wood Paving Blocks
The Barber Asphalt Paving Co. Office and Works: MAURER, N. J.

Office: 50 Church St. New York City
Works: Portsmouth, Va.
THE WYCKOFF PIPE & CREOSOTING CO.
Established 1881
SEND FOR CATALOGUE B
CREOSOTED Railroad Ties, Bridge Timbers, Piles, Poles, Paving Blocks and Lumber
MANUFACTURERS OF Cross Arms and Wyckoff Conduit for Underground Wires

Atlantic Creosoting & Wood Preserving Works, Norfolk, Va.
This thoroughly modern plant equipped with three cylinders and latest appliances for the treatment of piles and timber with Creosote Oil or other preservatives, is situated immediately on Norfolk harbor, with unequaled facilities for shipping via rail or water. We solicit your inquiries, assuring our customers lowest possible prices consistent with specifications and prompt delivery of orders.
W. H. WALES, JR., GENERAL MANAGER, NORFOLK, VA.

E. A. BOELL, President EDW. CHRISTIAN, Esq. and Gen. Mgr. PERCY A. SMITH, Asst. Mgr.
NORFOLK CREOSOTING CO.
Citizen's Bank Building, Norfolk, Va., U. S. A.
A MODERN PLANT Adapted to Filling the Most Rigid Specifications
Send for Descriptive Book Spanish or English

Have You the Most Competent Help?
If not, try our "Want" pages, for immediate results. Three cents a word.

THE RIPLEY COMBINATION PILE

All the durability and strength of a concrete pile; with the ease of handling and facility in construction of a wooden pile.
The ½ inch double coating of reinforced concrete renders the pile not only teredoproof, but fireproof, and at a cost but little more than creosoted wood piling.
Its lightness enables the contractor to handle and drive to advantage, as it weighs much less than the all concrete pile.
The bond between wood and concrete will stand all strains of driving and pulling.
Total length of pile need not be coated unless desired, reducing weight and cost.

(Patents Applied for)
Teredoproof Fireproof Durable
Economical Easily Handled
Can Be Made in Any Length
For Royalty Rights Address the Company

The Monks-Ripley Pile Co.
82 Beaver Street, New York City
RICHARD A. MONKS, President JOHN W. RIPLEY, M. Am. Soc. C. E. Sec. and Treas.

AMERICAN CREOSOTE WORKS, Inc., New Orleans, La. Station B
PILING, POLES, PAVING BLOCKS, TIES, TIMBER, LUMBER
PLANTS AT Bossier City, La. New Orleans, La.
Capacity 50,000,000 feet b. m. per annum
Facilities for shipping by water or rail

CREOSOTING. Docks, Railroads, Telegraph and Telephone Work, Wood Block Paving
On account of water and railroad facilities on Passaic River and C. R. R. of N. J., we can make immediate shipments to all points
American Creosoting Co., 95 Liberty St., N. Y. Works, Newark, N. J.

SOUTHERN CREOSOTING COMPANY, Ltd., SLIDELL, LOUISIANA U. S. A.
Twenty-eight miles from New Orleans, La., surrounded by the finest timber lands in the South. Facilities for shipping by water and rail.
CREOSOTED TIES TELEGRAPH POLES CROSS ARMS TIMBER PILES AND PAVING BLOCKS
A. B. C. Code used. Capacity, 22,000,000 feet per annum. Cable Address, Creosote, Slidell, La.

Auditorium Natatorium, St. Louis, Mo. Size 100 ft. x 185 ft. Largest in United States
Waterproofed with MEDUSA WATERPROOFING
Gives absolutely permanent results and does not affect strength, setting or color of Portland Cement.

Medusa White Portland Cement

A true Portland, perfectly white in color and equal or superior to any other white Portland Cement known.

Adapted to ornamental artificial stone work of the highest grade.

For exterior and interior use

Equal in strength to any gray Portland cement.

Write for sample pamphlet and price

Sandusky Portland Cement Co.
Sandusky, O., U. S. A.

F. L. SMIDTH & CO., *Engineers*

50 CHURCH STREET, NEW YORK

Specialists in

DESIGNING, EQUIPPING AND BUILDING

Portland Cement Making Factories

Specify and Use

Edison Portland Cement

It is fine

85% thru 200 98% thru 100

THE
Standard American Brand

For Sidewalks and all other work requiring the Highest Quality Portland Cement

Used by the U. S. Government and the Largest Contractors and Users of Portland Cements in the United States.

THORN CEMENT CO., Prudential Bldg., Buffalo, N. Y. Long Distance Phone

ALPHA PORTLAND

The Recognized Standard American Brand

On the market for the past nineteen years. One brand only manufactured—a strictly straight Portland which in uniformity and general excellence cannot be equaled.

Write for our Handsomely Illustrated Book. Sent Free.

ALPHA PORTLAND CEMENT CO.
General Office, 6 Centre Square, Easton, Pa.

SPECIAL QUALITY **MATCHAM BRAND** SPECIAL QUALITY

A NEW STANDARD 10% finer than other Standard Ground Portlands

TESTS

PROVE

SAND CARRYING CAPACITY 20% higher than other Standard Ground Portlands

THE ALLENTOWN PORTLAND CEMENT COMPANY, Allentown, Pa.

THE CUMMER DRYERS

For Mechanically Drying Everything
The F. D. Cummer & Son Co., Cleveland, O.

THE ATLAS DRYERS

Dry Nearly Everything
W. M. Cummer, Pres. THE ATLAS DRYER CO., CLEVELAND, OHIO

MEACHAM & WRIGHT COMPANY
CEMENT
CHICAGO

RUGGLES-COLES DRYERS

OF EVERY TYPE FOR ALL PURPOSES

We have built these machines for twelve years. Not one has ever failed.
Catalog and testimonials on request.

RUGGLES-COLES ENGINEERING COMPANY
CHICAGO, McCormick Building NEW YORK, 50 Church Street

IRON CLAD PORTLAND CEMENT

FINENESS—STRENGTH
SOUNDNESS—UNIFORMITY
The Glens Falls Portland Cement Co.
Glens Falls, N. Y. 156 Fifth Ave., New York

Automatic Improved **DRYERS** Economical—Efficient Great Capacity
For All Materials American Process Co. New York.

THE GIANT GRIFFIN MILL

40 inch Die 24 inch Roll

15,000 lbs. Crushing Effect

Will take Portland Cement clinker 1½ inches diameter from the kiln and deliver a finished product.
85 to 87% through 200 mesh screen.
13 to 15 bbls. per hour.
50 to 55 horse power.
Limestone, 5 to 8 tons per hour.
Coal, 5 to 6 tons per hour.
Other materials in proportion.

It saves cost in buildings.
It saves cost in installation.
It saves cost in power.
It saves cost in repairs.
It saves cost in attention.

Manufactured by

BRADLEY PULVERIZER CO.

37 Walbrook, LONDON, E. C.
92 State Street, BOSTON

The American Cement Engineering Company

Mechanical, Chemical & Civil Engineers

Examination of Properties Plants Designed
Mills Constructed
Unsatisfactory Operating Conditions Corrected
Chemical and Physical Laboratories for Cement and Cement Materials
Test Runs made, according to Mill Methods
Raw Materials Manufactured into Cement in any Quantities

315 FIFTH AVENUE NEW YORK

WEST TUBE MILL COMPANY

220 Broadway, New York

PULVERIZERS

SAYLOR'S PORTLAND CEMENT

Oldest American Cement.
COPLAY CEMENT MFG. CO.
1360 Fifth Ave. Bldg.
New York City

Riehlé Automatic Cement Testing Machine

Patented

Testing Outfits
1424 North 9th Street, Philadelphia, Pa.

SOUTHWESTERN STANDARD
SUPERFINE

Especially adapted to Engineering and all kinds of Reinforced Concrete

OKLAHOMA PORTLAND CEMENT CO. OK ADA, OKLA. PORTLAND CEMENT

Uniform Fine Ground Well Seasoned Absolutely Sound and Always Reliable

Quality Guaranteed
OKLAHOMA PORTLAND CEMENT CO.
Capacity 750,000 Barrels. Ada, Okla.

PULVERIZERS for Grinding HARD Materials

CEMENT, ORES, LIMESTONE, TRAP ROCK, COAL, ETC.
MINING AND CEMENT MACHINERY

KENT MILL CO. **170 Broadway, New York**

London, W. C., 31 High Holborn Charlottenburg 5, Windscheid Strasse 40, Berlin
See it at the Cement Show, New York, Madison Sq. Garden, Dec. 14-20, 1910. Chicago, Coliseum, Feb. 17-23, 1911

Kosmos Portland Cement

IS AN ESPECIALLY HIGH GRADE PORTLAND CEMENT

KOSMOS PORTLAND CEMENT COMPANY LOUISVILLE, KY.

Only one brand is manufactured

Kosmos Portland Cement Co. (INC.)
LOUISVILLE, KY.

The Ironton Portland Cement Co.

Manufacturers Ironton, O.

Located on N. & W. C. & O. C. H. & D. D. T. & I. Railways and Ohio River

LIMESTONE BRAND PORTLAND CEMENT

Product Guaranteed to pass all standard specifications

10th Year of Success
POSITIVELY NO SLAG USED
Used by U. S. Government and all railroads in vicinity.

FOURTH EDITION

General Specifications for Steel Roofs and Buildings

Price 25 Cents

General Description, Loads, Unit Strains, Lighting, Details of Construction, Painting, Erection.

By Charles Evan Fowler
M. Am. Soc. C. E.

The Engineering News Publishing Company

CHICAGO
"AA"

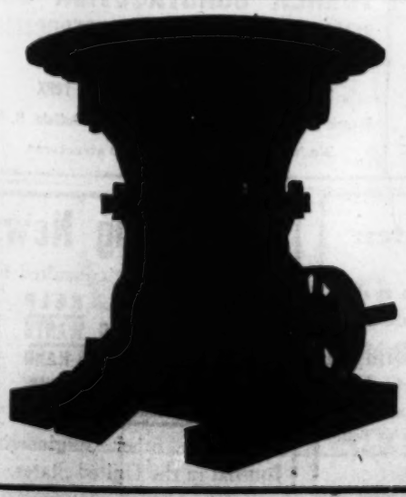
Factory at Oglesby near LaSalle Ill.

CHICAGO PORTLAND CEMENT COMPANY AA CHICAGO PORTLAND CEMENT CHICAGO ILL.

HIGHEST QUALITY CEMENT

Capacity, 1,250,000 Barrels Annually
CHICAGO PORTLAND CEMENT CO.
108 LaSalle Street, Chicago

PLEASE FAVOR US WHEN WRITING ADVERTISERS BY MENTIONING ENGINEERING NEWS



Austin Gyratory Crusher

The world's leading rock and ore breaker.

The only self lubricating Crusher.

The only Crusher having double countershaft bearing.

Simple construction, correct design.

Thousands in use.

Plans and specifications furnished for any sized plant.

Send for Catalogue No. 17

ALL experienced users recognize that the efficiency and durability of the suspension bearing, as applied to Gyratory Crushers, depends upon locating the bearing at the point of least gyration or movement of the main shaft.

A perfect suspension can be made only by locating the bearing at the point where there is no movement of the shaft. That being a mechanical impossibility, it follows that superiority is obtained in fixing the bearing at the point of least gyration of the shaft.

As the accompanying cut will show, the movement of the shaft at the point of suspension in the Austin Crusher is reduced to the minimum and practically eliminated. Consequently the highest possible degree of efficiency and durability is obtained.

Austin Manufacturing Co., Chicago

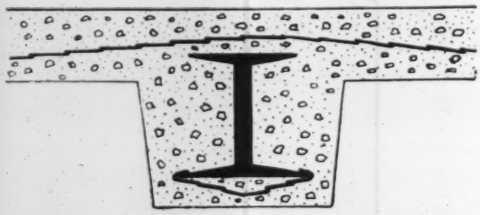
NEW YORK CITY OFFICE, 1682 Fulton Building, Hudson Terminal
MUSSENS LTD., Montreal, Canada, Canadian Sales Agents

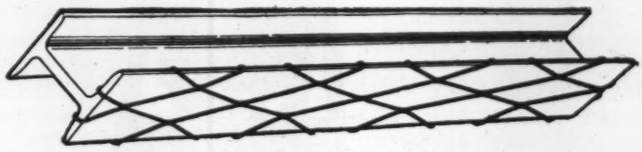
We ship this

You "snip" it like this

Bend it like this (need no tool)

Meets the requirements of Bureau of Buildings for Manhattan, Sept. 30, 1910.



USE IT LIKE THIS 

"Steelcrete" System of Beam Wrapping

The final solution of an awkward problem—low in first cost, efficient, and easily placed.

The Consolidated Expanded Metal Companies

1182 Broadway, NEW YORK — Keenan Bldg., PITTSBURG

Boston	The Eastern Expanded Metal Company
Philadelphia	The Expanded Metal Company of Philadelphia
Buffalo	Buffalo Expanded Metal Company
Washington	Southern Expanded Metal Company
New York	Expanded Metal Engineering Company

"EVERY POUND PULLS"

HAVEMEYER BARS

(ROUND OR SQUARE)

"EVERY POUND PULLS"

WILL SAVE YOU TONNAGE——THE PERFECT REINFORCEMENT

IMMEDIATE SHIPMENT FROM STOCK——QUICK SHIPMENT FROM MILLS

THE CONCRETE-STEEL COMPANY : : : : 29 BROADWAY, NEW YORK

SIMPLEST, STRONGEST, MOST ECONOMICAL FOR FLOOR CONSTRUCTION

No rods—no wire—no wooden false work is necessary with this ideal form of concrete floor, roof and wall reinforcement. Simply lay the interlocking plates and apply concrete.

BERGER'S

Ferro-Lithic

PLATES

are of a dovetailed, cross-ribbed, keystone formation. They combine the tensile strength of steel with the solidity of concrete, resulting in a solid, durable construction with minimum dead load.

As wooden false work is unnecessary, considerable time and money are saved in construction. A plastering or concreting surface is provided on either side.

Write for "Ferro-Lithic"—it gives you details

New York Philadelphia Boston Atlanta

The Berger Mfg. Co.

Canton, Ohio

Chicago St. Louis Minneapolis Kansas City San Francisco

Steel Concrete Structures

TUCKER & VINTON

Terminal Building

41st ST. and PARK AVE. NEW YORK CITY

BUSH FACTORY NO. 4
Foot 35th Street, Brooklyn
One of the six factories which we have constructed for the Bush Terminal Co.

TURNER CONSTRUCTION CO.

REINFORCED CONCRETE CONSTRUCTION

Engineers and Contractors

MAIN OFFICE: 11 BROADWAY, NEW YORK

Branch Office: 312 Prudential Building, Buffalo, N. Y.

We have completed over 300 structures

Daniel B. Luten

Indianapolis

Designing and Consulting Engineer

Reinforced Concrete Bridges

Over 3500 Erected

Associate Engineers in all States

Luten's Standard Specifications for Reinforced Concrete Highway Bridges, 10 cents each.

Engineering News

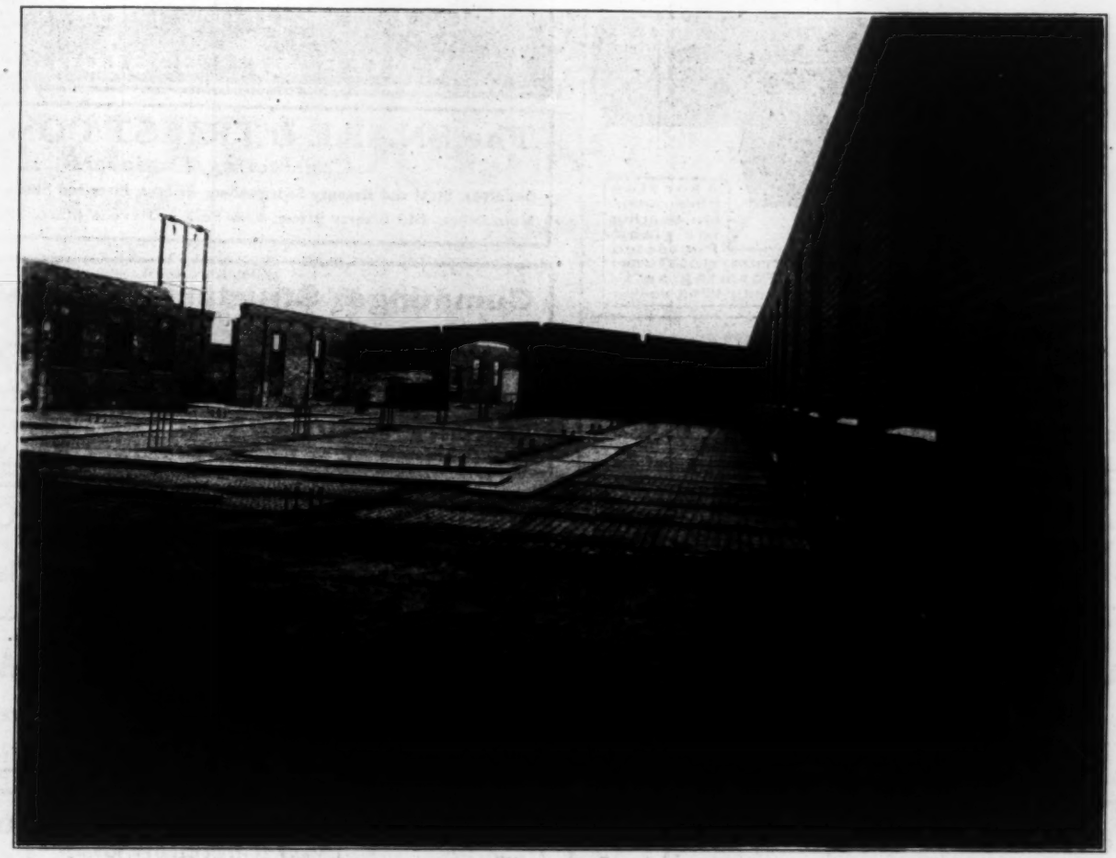
is more frequently consulted for

TECHNICAL HELP
MISCELLANEOUS WANTS
SALE OF SECOND-HAND MACHINERY AND EQUIPMENT

than any other Engineering Journal in the United States.

American Steel & Wire Company's

Triangle Mesh Concrete Reinforcement



Engineer, F. E. Barnes

BUCHANON & SMOCK LUMBER CO.'S MILL BUILDING
Asbury Park, N. J.

59,275 square feet, Styles 33 and 26 Triangle Mesh Concrete Reinforcement used.

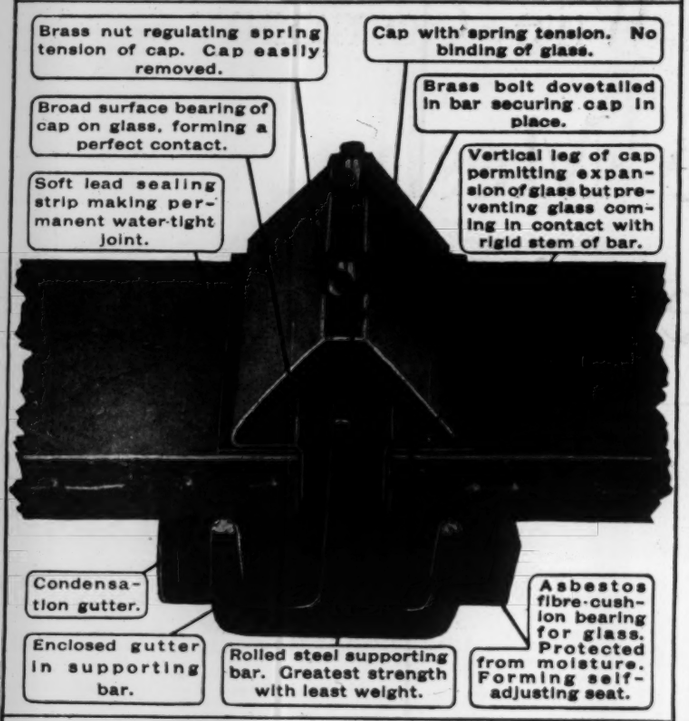
This mill was originally built with heavy wooden beams and girders and was an ideal "slow burning mill construction," thoroughly equipped with the best sprinkler system. It burned. The above illustration shows the mill in process of reconstruction, also how Triangle Mesh Reinforcement may be used for floor slabs with reinforced concrete beams and girders.

American Steel & Wire Company

Chicago New York Denver San Francisco

REX SKYLIGHTS

(PATENTED)


Brass nut regulating spring tension of cap. Cap easily removed.
Cap with spring tension. No binding of glass.
Brass bolt dovetailed in bar securing cap in place.
Broad surface bearing of cap on glass, forming a perfect contact.
Vertical leg of cap permitting expansion of glass but preventing glass coming in contact with rigid stem of bar.
Soft lead sealing strip making permanent water-tight joint.
Condensation gutter.
Enclosed gutter in supporting bar.
Rolled steel supporting bar. Greatest strength with least weight.
Asbestos fibre-cushion bearing for glass. Protected from moisture. Forming self-adjusting seat.

Schalkenbach and Budke

(INCORPORATED)

404 Claremont Avenue, Jersey City, N. J., U. S. A.

Missouri Valley Bridge and Iron Co.

LEAVENWORTH, KANSAS

Engineers and Contractors

For Bridges, both Substructures and Superstructures, Steel Buildings, Fireproof Wharves. Pneumatic and Open Foundations

BOSTON BRIDGE WORKS

O. H. ANDREWS, PRES. INCORPORATED

ENGINEERS AND CONTRACTORS

Steel Bridges, Buildings Roofs, Turntables, Etc.

47 WINTER ST., BOSTON, MASS.

The SNARE & TRIEST COMPANY

Contracting Engineers

Buildings, Steel and Masonry Construction, Bridges, Piers and Sheds, Coaling Plants

Main Office, 143 Liberty Street, New York Havana Office, 36D. Zulueta St.

(Established 1898)

Cummings Structural Concrete Co.

DESIGNERS AND BUILDERS OF

Concrete Structures

PITTSBURG, PA.

FRANK B. GILBRETH, General Contractor

M. Am. Soc. M. E. 60 Broadway, New York City.

New England Structural Co.

ENGINEERS AND CONTRACTORS

STEEL BUILDINGS AND BRIDGES

110 State St., BOSTON Works: EAST EVERETT, MASS.

THE VARIETY IRON & STEEL WORKS COMPANY

CLEVELAND, OHIO

Blast Furnaces, Plate Work, Boilers, Foundry and Machine Work

AND STRUCTURAL WORK OF ALL KINDS

STANDARD BRIDGE CO.

Engineers and Contractors OMAHA, NEB.

THE TOLEDO BRIDGE AND CRANE CO.

TOLEDO, OHIO

Steel Bridges and Buildings Electric Traveling Cranes

Coal and Ore Handling Machinery

WESTERN OFFICE: 355 DEARBORN ST., CHICAGO

San Francisco Bridge Company

ENGINEERS AND CONTRACTORS

Dredging, Dredging Machines, Land Reclamation, Docks, Piers, Foundations, Bridges

865 Monadnock Building SAN FRANCISCO

The Ferguson Contracting Company

J. VAN VECHTEN OLCOTT, Receiver

RAILROAD CONTRACTORS

50 CHURCH STREET NEW YORK

The United Engineering and Contracting Co.

Engineers and Contractors

17 WEST 42d ST., NEW YORK.

Telephone, 3273 Bryant.

RAILROADS, TUNNELS, BRIDGES, DAMS, DIFFICULT FOUNDATIONS, AND COMPLETE EQUIPMENT OF POWER PLANTS

Unusual and difficult undertakings, where an Engineering training is of value in the conduct of the work, especially interest us. Plans and Specifications furnished.

The ROBBINS-RIPLEY Co.

Engineers and Contractors

Consulting Engineering, Estimates, designs and plans furnished. Structural Steel, Buildings, Pier Sheds and Dock Work, Piling, Foundations and Concrete Work.

30 San Francisco St., San Juan, Porto Rico

50 Church Street, New York City

CARTER CONSTRUCTION COMPANY

JOHN B. CARTER, President

RAILROAD BUILDERS

General Office: Room 918, The Temple, 184 La Salle St., Chicago

Branch Office: 710-712 Keystone Building, Pittsburgh

O'ROURKE ENGINEERING CONSTRUCTION CO.

345 FIFTH AVENUE, NEW YORK

A LARGE AND COMPLETE PLANT FOR THE CONSTRUCTION OF PNEUMATIC AND OTHER FOUNDATIONS

Designs and estimates for all kinds of deep or difficult foundations promptly furnished

Exclusive Control of Wooden Cylinder Caissons, Oblique Cutting Edges, Removable Roofs of Air Chambers, Safety Air Shafts and Combination Man and Material Air Locks for Rapid, Safe and Durable Construction.

Arthur McMullen & Co.

SINGER BUILDING NEW YORK

Specialty: Pneumatic Caisson Foundations

Contractors for Bridge and Trestle Work Superstructures, Docks, etc.

STUPP BROS. BRIDGE AND IRON CO.,

ST. LOUIS Missouri

Manufacturers and Contractors Bridges and Structural Work

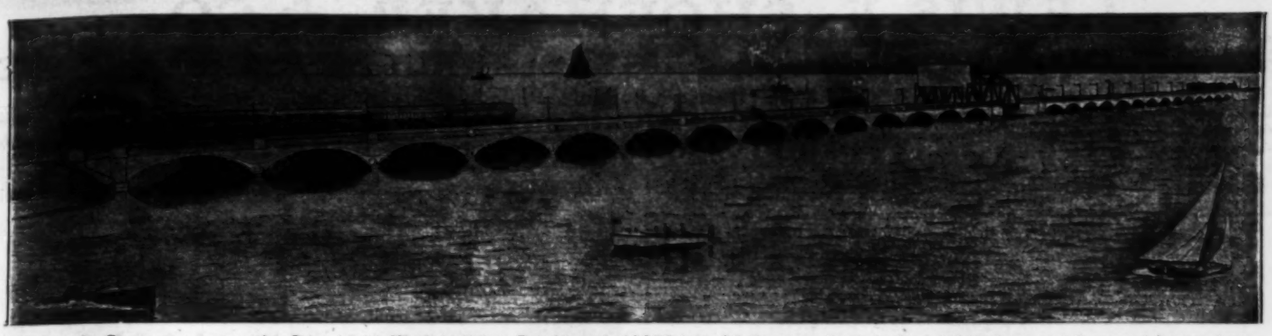
CLINTON BRIDGE & IRON WORKS

Heavy Steam Forging a Specialty. Eye Bar Plant in Connection with Works. All Structural Shapes kept in Stock.

CLINTON, IOWA

Manufacturers of Bridges, Viaducts, Girders and Substructures.

Iron and Steel Work for Buildings, Roof Trusses, Factories, Car Barns, Train Sheds, Steel Water Towers, etc.



Galveston Causeway—connecting Island with Virginia Point—Total length 10675 feet—28 Concrete Steel Arches—1 Lift Span and Protected Approaches.

Now Under Construction — Designed by **Concrete-Steel Engineering Co.** — Reinforced with Diamond Reinforcing Bars

CONSULTING ENGINEERS

Edwin Thacher, M. Am. Soc. C. E. — **Park Row Building, New York** — William Mueser, M. Am. Soc. C. E.

Infringement of Basic Patents for Waterproofing Portland Cement owned, controlled, or in which this Company is interested will be prosecuted in the United States or any other country.

WE ARE CONTRACTORS FOR THE

WATERPROOFING Of Quantities of CEMENT

OF ANY BRAND *ON THE SITE OF WORK*

COMPOUND

SEVEN CENTS PER LB., F. O. B., ANY R.R. STATION

Mixing Machine Loaned Free of Charge with Quantities

McCORMICK WATERPROOF PORTLAND CEMENT CO.

CHICAGO OFFICE
159-161 Randolph Street

PITTSBURG OFFICE
Keystone Building

MAIN OFFICE
Bank of Commerce Building, ST. LOUIS, MO.

HIGH GRADE REPRESENTATIVES WANTED

MONOLITH STEEL CO.

(INCORPORATED)
WASHINGTON, D. C.

Concrete Is Scientifically Reinforced by Monolith Girder Bars Having Fixed Webs, Column Bars Stapled and Banded, Fabricated Bars for Floors and Roofs, Expanded Metal under Golding Patents.

Quick Delivery of Bars and Metal from Stock.

Designs, Estimates and Catalogues on Request.

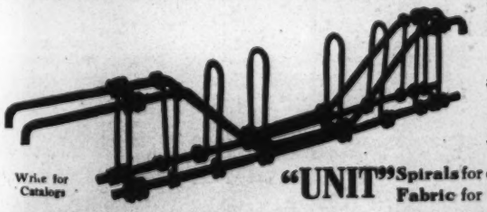
Please Mention ENGINEERING NEWS When Writing Advertisers

CONCRETE BEAM REINFORCEMENT

"UNIT" FRAME

The most perfect reinforcing for concrete beams and girders.

Leaves our mill a complete unit. Goes into form without any adjustment.



Write for Catalogs

"UNIT" Spirals for concrete columns.
Fabric for concrete slabs.

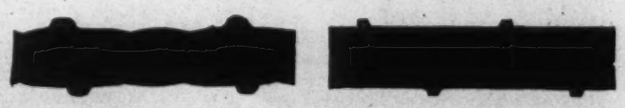
STRENGTH——ECONOMY——ABSOLUTE ACCURACY.

American System of Reinforcing,

922 Continental National Bank Bldg., Chicago, Ill.

Mill and Warehouse—Arkadelphia Milling Co., Arkadelphia, Okla. Herringbone Frames and Lug Bars Used Throughout.

LUG BARS
FOR CONCRETE REINFORCEMENT



ALL ROLLED FROM NEW BILLET STEEL
PERFECT MECHANICAL BOND
IMMEDIATE SHIPMENT GUARANTEED
RUSH ORDERS OUR SPECIALTY

The General Fireproofing Company

Youngstown, Ohio

LEWIS F. SHOEMAKER & CO.

SCHUYLKILL BRIDGE WORKS **STEEL BRIDGES AND BUILDINGS**

Works: Pottstown, Pa. General Offices: Harrison Building, Philadelphia New York Office: 45 Broadway

STROBEL STEEL CONSTRUCTION CO. CHICAGO, ILL. CONTRACTING ENGINEERS — BRIDGES BASCULE BRIDGES — STRUCTURAL STEEL WORK TURNTABLES

Berlin Construction Company

STEEL BUILDINGS
BRIDGES
STRUCTURAL WORK

Offices and Works, BERLIN, CONN.
220 Broadway, New York
Springfield, Mass.

PITTSBURG BLOCK AND MFG. CO.

Successors to PATTERSON MFG. CO.
Manufacturers of the Genuine
PATTERSON BLOCKS
Special: HEAVY BLOCKS for WIRE CABLES
Sheaves Bushed and Self-Oiling
RATCHET COUPLINGS
818 South Ave., Allegheny, Pa.
Formerly at 54 Water St., Pittsburg, Pa.
WRITE FOR CATALOG AND DISCOUNT SHEET

Baltimore Bridge Company

GENERAL OFFICE AND WORKS
Bush Street and B. & O. R.R., Baltimore, Md.
New York Office, 36 East 23d Street

Steel Bridges and Buildings

SPECIAL FACILITIES FOR EXPORT SHIPMENTS

STEEL BUILDINGS & BRIDGES
STEEL TANKS & CAISSONS RIVETED STEEL PIPE
Wm. B. Scaife & Sons Co., Pittsburgh, Pa.

Snead Architectural Iron Works

LOUISVILLE, KY.
STRUCTURAL STEEL and ORNAMENTAL IRON

KENWOOD BRIDGE CO.

PAUL WILLIS PRESIDENT — A. J. T. BENNETT SECRETARY
ENGINEERS AND BUILDERS OF STRUCTURAL STEEL WORK
OFFICE, 1416 FIRST NATIONAL BANK BUILDING, CHICAGO
WORKS, GRAND CROSSING, ILL. TELEPHONE, "RANDOLPH 1438"

THE STRAUSS BASCULE BRIDGE CO.---ENGINEERS

Specialists in Movable Bridges. Designers of
STRAUSS TRUNNION BASCULE BRIDGES
Fort Dearborn Building, Chicago

The Massillon Bridge & Structural Co.

MASSILLON, OHIO
DESIGNERS AND BUILDERS OF
Bridges, Buildings, Mill Buildings, Water Tanks, Etc.

Please Mention ENGINEERING NEWS When Writing Advertisers

SCHERZER ROLLING LIFT BRIDGES

Fulfill Every Modern Requirement of a Movable Bridge, and are Replacing Swing Bridges in this Country and Abroad. Write us for Information, Sketches and Estimates.
THE SCHERZER ROLLING LIFT BRIDGE CO.
Cable Address: Scherzer, Chicago — Main Office, Monadnock Block, Chicago, U. S. A. — Eastern Office: 220 Broadway, New York City

MILWAUKEE BRIDGE COMPANY Engineers, Contractors, Manufacturers Steel Framed Structures of all kinds. MILWAUKEE, WIS.

STEEL STRUCTURES OF ALL KINDS Designed and Fabricated by
THE WHITEHEAD & KALES IRON WORKS, Detroit, Mich.

THE BEST BLOCKS APE **PATTERSON'S**
All sheaves bushed. All hooks made from stay-bolt iron and flattened
Write for new Catalogue No. 2
W. W. PATTERSON COMPANY, 54 Water Street, Pittsburg, Pa.

THE MOUNT VERNON BRIDGE CO.

ENGINEERS AND MANUFACTURERS OF
Iron and Steel Mill Buildings and Structural Work
Railway and Highway Bridges, Roofs, Viaducts, etc.
MOUNT VERNON, OHIO

MORAVA CONSTRUCTION CO.,
MANUFACTURERS **STRUCTURAL STEEL**
SEE LARGER AD FIRST ISSUE EACH MONTH. CHICAGO, ILL.

Established 1868 Incorporated 1886 Reincorporated 1905
PENN BRIDGE CO. BEAVER FALLS, PA.
SHOPS, MORADO, PA., and CLAYSVILLE, PA.
Capacity, 18,000 tons per annum
Contractors and Manufacturers, Bridges, Buildings and Structural Steel. FOUNDRY AND MACHINE WORK

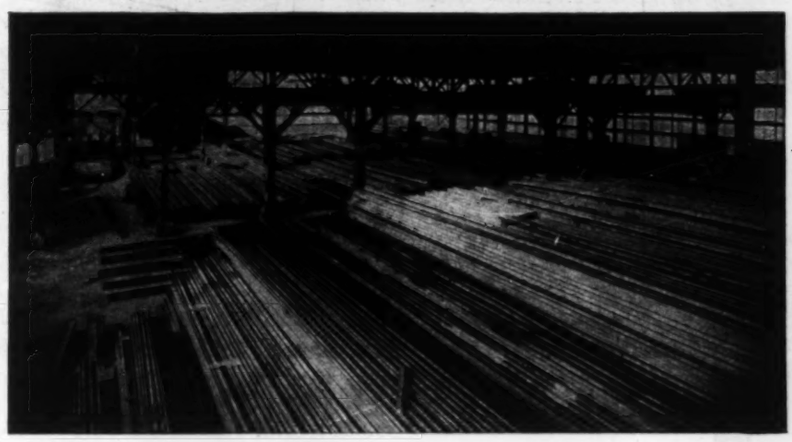
MACHINE SHOP—823 ft. long, with wing, 80 x 240 ft.

RIVERSIDE BRIDGE CO. **STEEL STRUCTURES** MARTINS FERRY, OHIO

PITTSBURG WAREHOUSE

PITTSBURG, PA.

Structural Shapes, Plates, Bar Mill Products



Stock List Sent On Request

View of Structural Bay

IMMEDIATE SHIPMENT

For information write to

PITTSBURG WAREHOUSE

CARNEGIE BUILDING, PITTSBURG, PA.

Or to CARNEGIE STEEL COMPANY

at the following District Offices

Birmingham	Buffalo	Cincinnati	Denver	New Orleans	Philadelphia	Portland	St. Louis
Boston	Chicago	Cleveland	Detroit	New York	Pittsburg	San Francisco	St. Paul

Export Representatives: United States Steel Products Co., New York.

VAILE & YOUNG'S

PATENT METALLIC

SKYLIGHTS

WITHOUT PUTTY

Perfect Construction for RAILROAD BUILDINGS, FACTORIES, etc., where LARGE and CONTINUOUS LIGHTS are required.

VAILE & YOUNG, Baltimore, Md.

THE L. SCHREIBER & SONS CO.

CINCINNATI

STRUCTURAL STEEL ORNAMENTAL IRON

BRANCH OFFICES

NEW YORK CHICAGO PITTSBURG ATLANTA
NEW ORLEANS SAN FRANCISCO RICHMOND

CARBONIZING COATING

TRADE MARK

For Preservation of Iron and Steel

The Goheen Manufacturing Co., Canton, Ohio, U. S. A.

ACHESON-GRAPHITE

This Electric Furnace Product is a Paint Pigment of the Highest Quality. It is of far higher purity than any natural graphite and makes an ideal Protective Coating.

Send for Paint Booklet 221 Y.

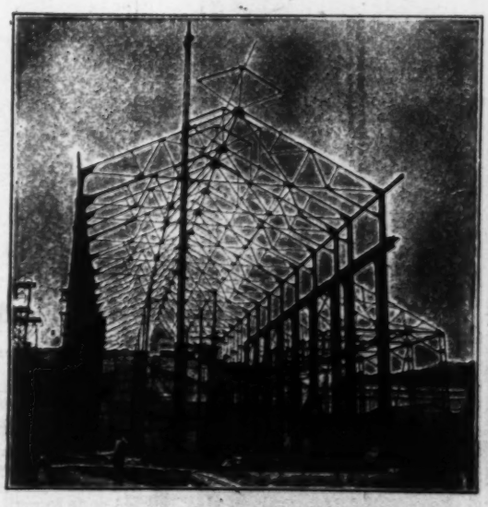
INTERNATIONAL ACHESON GRAPHITE COMPANY

NIAGARA FALLS, N. Y.

We are the only Makers of Graphite in the World

MINNEAPOLIS STEEL & MACHINERY CO.

MINNEAPOLIS, MINN.



MIAMI COPPER COMPANY, MIAMI, ARIZONA.

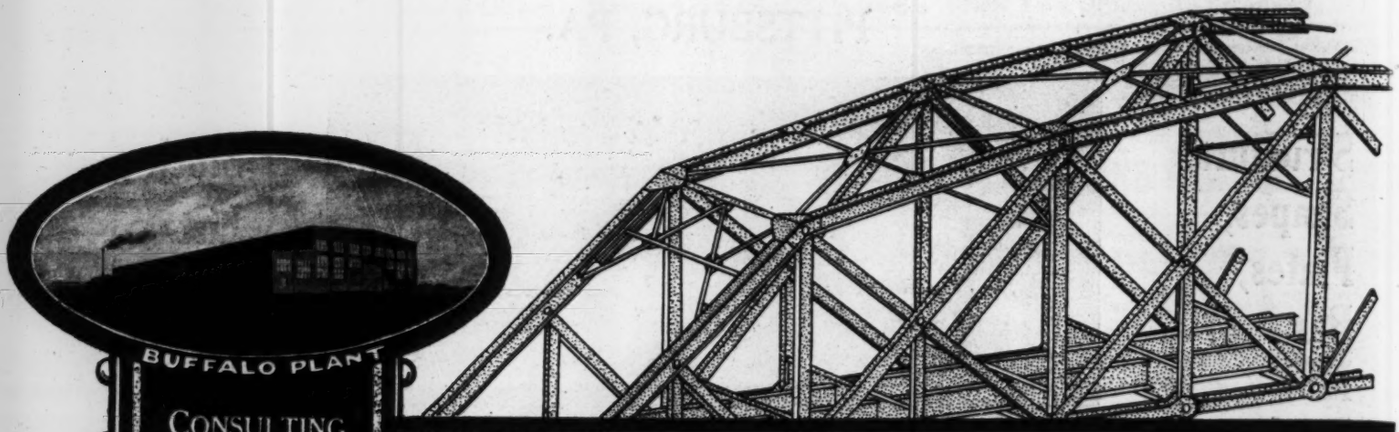
We are designers and fabricators of all kinds of

Structural Steel Buildings

Designs and Estimates furnished

BRANCH OFFICES

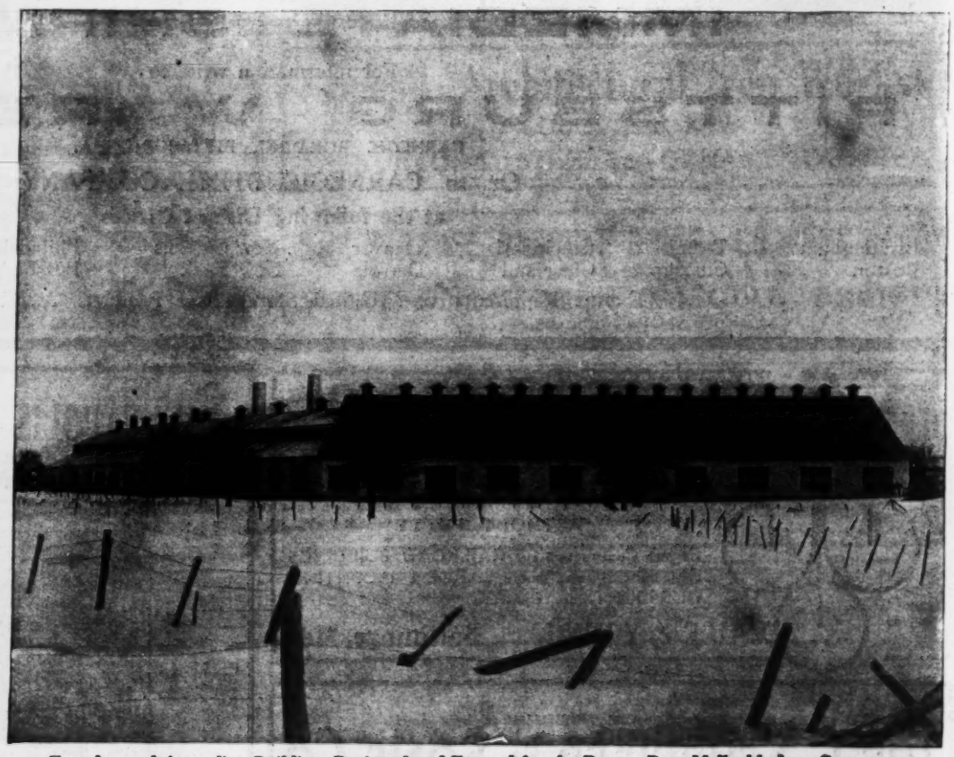
DENVER, COLO.: 313 Mining Exchange SALT LAKE CITY, UTAH: 322 Felt Bldg.
SEATTLE, WASH.: 338 Globe Bldg. EL PASO, TEX.: 313 E. P. & S. W. Bldg.
BUTTE, MONT.: 382 Phoenix Bldg.



LACKAWANNA BRIDGE CO.

CONSULTING
ENGINEERS
DESIGNERS
and
MANUFACTURERS
of
STEEL
STRUCTURES
RAILWAY
BRIDGES
MILL
FACTORY
and
SHOP
BUILDINGS

GENERAL
CONTRACTORS
for
FIRE PROOF
CONSTRUCTION



Foundry and Annealing Building, Designed and Erected for the Beaver Dam Malleable Iron Company, Beaver Dam, Wisconsin.
This building is 158' by 700'. Commenced Nov. 15th, 1909. Completed Feby. 24th, 1910.

Worden-Allen Company
Shops: Milwaukee

Lackawanna Bridge Company
Shops: Buffalo

OFFICES:

115 Adams Street, Chicago
Fidelity Bank Building, Buffalo

50 Church Street, New York
Port Washington Road, Milwaukee
730 Penobscot Building, Detroit
Houghton, Michigan

We carry in both Buffalo and Milwaukee a large stock of standard shapes, for immediate delivery, which we will cut to desired lengths.
Ask us to mail you our Stock Sheets regularly.

WORDEN-ALLEN CO.

FORT PITT BRIDGE WORKS OF PITTSBURG, PA.

We Make a Specialty of Quick Delivery **Structural Steel** For Bridges, Buildings, etc.

General Office, HOUSE BLDG., PITTSBURG, PA.
NEW YORK OFFICE, 45 BROADWAY
CHICAGO OFFICE, FISHER BUILDING
Purchasing Dept. and Works, CANONSBURG, PA.

Double Track Deck Plate Girder Bridge at Towanda, Pa., over the Susquehanna R. for Lehigh Valley R.R. Co. 13 spans 129 ft. 6 in. long; 1 span 120 ft. long

All Work Done on the Premises from Ore to Finished Product.

THE PHOENIX BRIDGE COMPANY

Capacity of Bridge Works, 50,000 tons per annum.

Engineers and Builders of Bridges and other Structures of Steel

Offices: 410 Walnut St., Philadelphia 49 William St., New York Phoenixville, Pa. 110 State St., Boston 527 Pierce Bldg., St. Louis 26 Victoria St., London, Eng.

BRIDGES
VIADUCTS
TURNTABLES
POWER HOUSES
STRUCTURAL STEEL

VIRGINIA Bridge and Iron Co.

Contracting Offices { Memphis, Tenn. Atlanta, Ga. New Orleans, La.

General Offices ROANOKE, VA.

Works { Roanoke Memphis Atlanta

Annual Capacity 100,000 Tons

Pels Beam Shears

TYPE RT.
Open Throat Shear. Made in all sizes

will increase your output and reduce your operating expenses. The quickest acting, cleanest cutting, cheapest running devices on the market for cutting structural shapes.

Over 300 in use.

Write for descriptive matter and Catalogue No. 60.

HENRY PELS & CO.
92 West St., New York

Largest manufacturers of punching and shearing machinery in the world.

WISCONSIN BRIDGE AND IRON COMPANY, Milwaukee, Wis.

MINING AND MILL BUILDINGS BRIDGES STRUCTURAL WORK

CHAMPION BRIDGE CO.
WILMINGTON, OHIO

Manufacturers of Bridges & Structural Work

BELMONT IRON WORKS
Philadelphia and Eddystone, Pa.

Steel Bridges and Buildings

We have just issued CATALOGUE of representative structures furnished by us. Engineers, architects and prospective purchasers please address DEPARTMENT "N."

New York Office 45 Broadway, N. Y. City

HOT METAL TRUCKS

Riter-Conley Mfg. Co.
PITTSBURGH

PLATE AND STRUCTURAL WORK OF EVERY DESCRIPTION

COMPLETE PLANTS

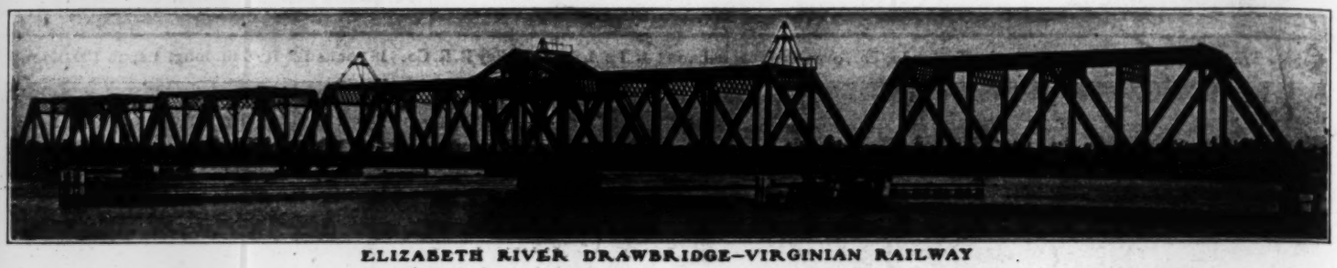
The BUCKEYE
TROUGH FLOOR
IS THE BEST FOR BRIDGES, ROADWAYS OR SIDEWALKS
IS ALSO ADAPTED FOR FLOORS OF HEAVY WAREHOUSES, MACHINE SHOPS, FIRE STATIONS, SIDEWALK AREAS, FIREPROOF BUILDINGS AND VAULTS
THE YOUNGSTOWN IRON & STEEL ROOFING CO.
YOUNGSTOWN, OHIO

CONTRACTING OFFICES
Pittsburgh, Pa., Park Bldg.
New York, 21 Park Row
Chicago, 1st National Bank Bldg.
St. Louis, 3d National Bank Bldg.
San Francisco, Cal.
Pottstown, Pa.

McCLINTIC-MARSHALL CONSTRUCTION COMPANY

ANNUAL CAPACITY, 150,000 TONS

WORKS
Pittsburgh, Pa.
Pottstown, Pa.
Carnegie, Pa.

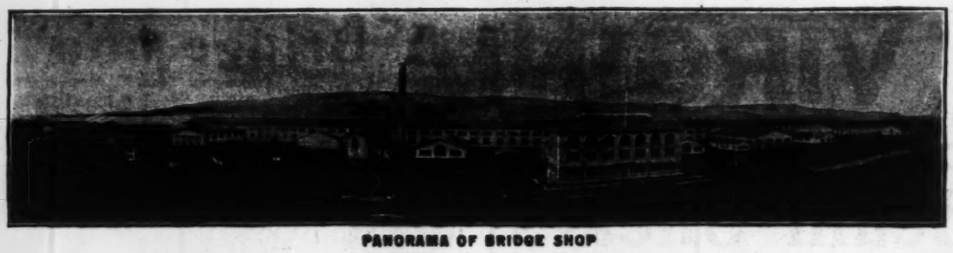


ELIZABETH RIVER DRAWBRIDGE—VIRGINIAN RAILWAY

STEEL BRIDGES, BUILDINGS, ETC.

THE PENNSYLVANIA STEEL COMPANY
BRIDGE & CONSTRUCTION DEPARTMENT
STEELTON, PA.

OFFICES
NEW YORK, N. Y.
71 Broadway
BALTIMORE, MD.
Continental Trust Bldg.
BOSTON, MASS.
70 Kilby St.
CHICAGO, ILL.
Western Union Bldg.
MEXICO CITY, MEX.
Edificio de "La Mutua"



PANORAMA OF BRIDGE SHOP

OFFICES
PHILADELPHIA, PA.
Morris Bldg.
SAN FRANCISCO, CAL.
1505 Chronicle Bldg.
ST. LOUIS, MO.
Commonwealth Trust Bldg.
LONDON, ENG.
110 Cannon St.
STEELTON, PA.
At Works

DESIGN, FABRICATE, ERECT—ALL STRUCTURES OF STEEL

Oliver Building, Pittsburg

American Bridge Company of New York

STRUCTURAL STEEL FOR EVERY PURPOSE

GENERAL OFFICES
Hudson Terminal
30 Church Street New York

Export Representatives: United States Steel Products Co.

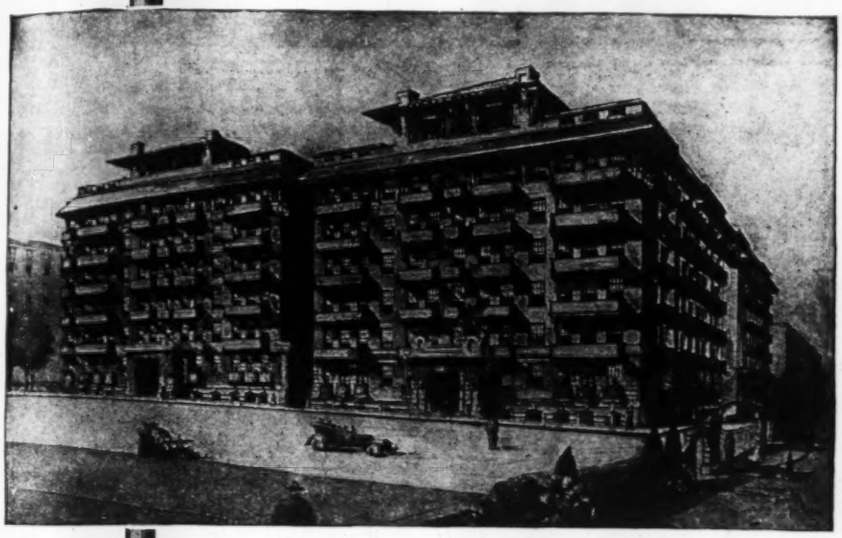
Roofs

Note Continuous Bond

Floors

THE SHIVELY SANITARY TENEMENTS (New York City)

For MRS. WILLIAM K. VANDERBILT, SR.



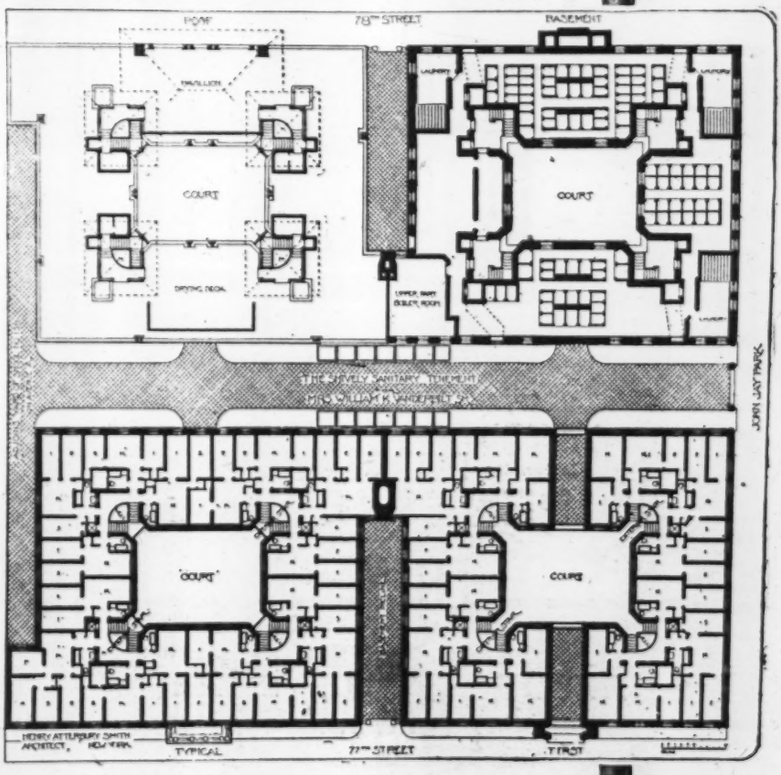
Architect
HENRY ATTERBURY SMITH

Builders
JACOB & YOUNGS

Contractors for Fireproof Floor and Roof Arches
GOLLIEK & SMITH

Clinton Galv. Wire Lath Used for All Partitions
GEO. S. HOLMES CO. Contractors

ROOF AND FLOOR PLAN



All floors in this building reinforced with CLINTON WELDED WIRE, SYSTEM E, TYPE 1

All partitions erected with CLINTON GALVANIZED WIRE LATH

Over ninety-seven million feet of our reinforcing in use to-day. Architects and builders who have used electrically welded reinforcing keep right along using it year after year. There is no waste, it is fool-proof in the installation, and always does the work. Write us about your concrete reinforcing problems of any description, and we will be glad to describe the application of our product to same. An illustrated book on concrete reinforcing sent upon request.

The forthcoming issue of *Steel Fabric* will contain a detailed description and illustration of above building. Copy sent free.

CLINTON WIRE CLOTH CO., Clinton, Mass.

Ceilings

Partitions

Fireproofing Departments:

ALBERT OLIVER
133 West 27th Street, New York City
WASHINGTON: ROSSLYN SUPPLY CO., Colorado Building
CHICAGO: CLINTON WIRE CLOTH CO., 30-32 River Street

L. A. NORRIS
835 Monadnock Bldg., San Francisco
BUFFALO, N. Y.: Buffalo Wire Works Co., Inc.
SEATTLE: L. A. NORRIS, 909 Alaska Bldg.

THE BEST FOR ALL USES

UNIFORM—
STRONG—
DURABLE

Every barrel guaranteed

Wm. G. Hartranft Cement Co.

Sole selling agent

Real Estate Trust Bldg., Philadelphia, Pa.

IN USE TWENTY-TWO YEARS

DRAGON PORTLAND CEMENT

Dragon

PORTLAND CEMENT

Send for our latest catalogue.

THE LAWRENCE CEMENT COMPANY, New York
LAWRENCE PORTLAND CEMENT CO., Philadelphia

Quick or Slow Set; but Quick Cement is less durable.

The oldest and strongest makers of high grade cement in the world.

ALSEN

The Panama Canal Cement. Write for list of other important works. The safest and best colored cement for sidewalks and blocks.

DEXTER Portland Cement

SAMUEL H. FRENCH & CO.

Used in the Great Hudson Tunnels and New Pennsylvania Terminal Station, New York

Send for our Free Booklet on this remarkable work, and booklets on Concrete Buildings of Moderate Cost.

GIANT PORTLAND CEMENT

AMERICAN CEMENT CO.
Philadelphia

The Standard American Brand

ATLAS PORTLAND CEMENT

ALWAYS UNIFORM

Storage capacity, 4,000,000 barrels.

Productive capacity over 50,000 bbls. per day or 18 million bbls. per year.

THE ATLAS PORTLAND CEMENT CO.

30 Broad Street, New York

Send for our Books on Concrete Construction

FREDENBURG & LOUNSBURY
NEW YORK

Bath Portland Cement

Front Bricks
Paving Blocks

CONSOLIDATED ROSENDALE CEMENT CO.
BROOKLYN BRIDGE BRAND
ROSENDALE HYDRAULIC CEMENT
50 CHURCH ST. N.Y.

A Perfect Record for Eleven Years

The Standard Brand — MARQUETTE PORTLAND CEMENT — Always Uniform

MARQUETTE CEMENT MFG. CO.

General Offices and Works, La Salle, Ill.
Chicago Office, Marquette Bldg.

UNIVERSAL PORTLAND CEMENT COMPANY

"Cement Drain Tile"

an investigation of their use and misuse in land drainage since the year 1871. This free, illustrated booklet is now ready for distribution. Address the nearest office of the Company.

Universal Portland Cement Co.

Chicago—Pittsburg

Annual Output 8,000,000 Barrels

HERCULES
Strengthening and Waterproof
COMPOUND

FOR CONCRETE FOUNDATIONS, BLOCKS, STUCCO, MASONRY BINS and CEMENT WORK OF ALL KINDS

The Greatest Compound on the market because increased Tensile Strength is secured and absolute impermeability even in a 1-3 mixture.

Send for Booklet of Tests

THE HERCULES WATERPROOF CEMENT CO.
BUFFALO, N. Y.

Trench Machines

We Sell and Lease All Kinds of Hoisting and Conveying Machines for Trench Work

Catalogue Sent Upon Request

Carson Trench Machine Co.

BOSTON, MASS.

BRANCH OFFICES:
Park Building, Cleveland;
299 St. James St., Montreal.

Uniformity PORTLAND Reliability

PENNSYLVANIA CEMENT

"PENNSYLVANIA"

CEMENT

BRISTOL'S
Recording Instruments

for Pressure, Temperature and Electricity.

Most complete line of Recording Instruments in the world.

Write for new Illustrated Index of Bristol Instruments, with more than 50 large illustrations.

THE BRISTOL CO., Waterbury, Conn.

GRAVITY and PRESSURE FILTERS

LICENSEES
Pittsburgh Filter Mfg. Co.
Norwood Engineering Co.
Roberts Filter Mfg. Co.
J. N. Chester, C. E.

THE NEW YORK CONTINENTAL JEWELL FILTRATION COMPANY

167 Dearborn Street, CHICAGO — Owners of the NEGATIVE HEAD FILTER PATENT — 15 Broad Street, NEW YORK

TRADE MARK

VULCANITE PORTLAND CEMENT

REG. U.S. PAT. OFFICE

The Brand with a Reputation

The following pamphlets for gratuitous distribution:

No. 4—Hair Cracks and Crazing on Concrete Surfaces.
" 6—Economical Selection and Proportion of Aggregates.
" 7—Cement Sidewalk Paving, Method of Construction.
" 8—Reinforced Concrete Residences.
" 9—Uses of Mineral Oil Mixed Concrete.
" 10—Concrete Surface Finishes.

"Things Worth Knowing," Nos. 1 and 3.

Main Office:
Land Title Bldg., Philadelphia
Main Sales Office:
Fifth Ave. Bldg., Madison Sq., New York

LEHIGH PORTLAND CEMENT COMPANY

LEHIGH PORTLAND CEMENT

LEHIGH
PORTLAND
CEMENT

ROSENDALE HYDRAULIC CEMENT

HIRAM SNYDER & CO., 261 Broadway, New York